

# COMPUTERWORLD

## INSIDE

**Spotlight** — Taking measure of performance monitoring/capacity planning software. Pullout section follows page 112.

**In Depth** — A few reasons why mainframes are no longer necessary. **Page 75.**

**Air-cooled supercomputers** from ETA Systems aim at creating a new class of technical computing. **Page 6.**

**Ashton-Tate raises legal claim** in effort to thwart standardization of the Dbase language. **Page 133.**

**Another reorganization** by AT&T spins off computer sales into a dedicated marketing group. **Page 8.**

**Microsoft buys** into the future of networking with an E-mail package for Apple systems and plans to move the product to PCs. **Page 2.**

**IBM turns in higher profits** but earns mixed reviews as other firms soar. **Page 4.**

**The executive in charge** of corporate systems for Chase Manhattan Bank was steered away from engineering by an eighth-grade teacher who said it was a man's profession. **Page 95.**

**3M plans a wholesale embrace** of ISDN technology during the next five years. **Page 53.**

**Senior MIS execs** get the Windows treatment from Bill Gates. **Page 18.**

## Tools give new life to aging VSE

*Software skirts lock-file problem, staves off costly upgrade to MVS*

BY CHARLES BABCOCK  
CW STAFF

MIAMI — Terry Woodward, lead technical specialist at Storer Administration, Inc., realized a year ago that his IBM 4381 Model 3 was overtaxed and could not handle his six IBM VSE systems much longer.

At the time, capacity planning at the cable services company indicated that its processor would run out of steam in June and Woodward would face both a \$2 million upgrade and a possible

conversion to IBM's heavy-duty operating system, MVS.

But Woodward is still running multiple VSEs on his 4381 because of a new software product that better manages the lock-file contention that frequently plagues VSE, he said. "We feel we've delayed our processor upgrade for eight months, and we may not have to move to MVS at all," Woodward added. The \$6,000 product that helped stave off both moves was Softkey from start-up firm Jeyco in Lincoln, Neb. Softkey is typical

of a set of products that has emerged during the last year to extend the life of the still widely used VSE operating system.

Nearly half of today's 6,444 VSE systems are employed as multiple systems under IBM's VM with shared direct-access storage devices, according to market research firm Computer Intelligence. Going to multiple VSE systems under VM is viewed as an intermediate step between VSE and MVS, but many users — typically smaller,

*Continued on page 8*

## Encryption standard to get reprieve

BY MITCH BETTS  
CW STAFF

WASHINGTON, D.C. — Despite opposition in the intelligence community, the National Bureau of Standards plans to reaffirm its support for the widely used Data Encryption Standard for another five years, according to NBS sources.

That would be good news for MIS managers in the banking industry and in federal agencies, who say they increasingly depend on DES-based equipment to protect electronic funds transfers, data communications and sensitive computer data from unauthorized access.

"The progress of information security in the private sector would be seriously impeded by the loss of the Data Encryption Standard," said Joan M. Reynolds, vice-president of corporate data security at Chemical Bank in New York. "Banks will hesitate to protect themselves with a technique that the government does not consider prudent," she wrote in comments to the NBS.

### Support eroded

Federal support for DES has been in question for more than a year because the National Security Agency, a U.S. intelligence organization, has shifted its support away from DES in favor of new, secret encryption algorithms embedded in silicon [CW, May 19, 1986].

The DES became a standard  
*Continued on page 134*

## Users scoping out DEC net controls

BY ELISABETH HORWITT  
CW STAFF

As IBM continues to step up its campaign to get Netview accepted as a de facto industry standard, Digital Equipment Corp. is quietly promoting its products' abilities to manage a multiven-dor network.

While DEC products have made it onto the lists of many companies shopping for network management systems, MIS managers have long criticized DEC's inability to provide the centralized control and monitoring features that are among the strengths of Netview.

For some customers, DEC network management products appeared to spring from nowhere during last month's Decworld '87 in Boston.

"At the 1986 Decworld, we saw one very simple [network] histogram, and when we asked about other products, we got a lot of foot shuffling," reported Jay Guenon, president of LAM Consulting, Inc., which is currently designing a network for the Maryland Institute for Emergency Medical Services Systems. "This year, all sorts of management software had come out — or else they were suddenly pushing the products they

have," Guenon added.

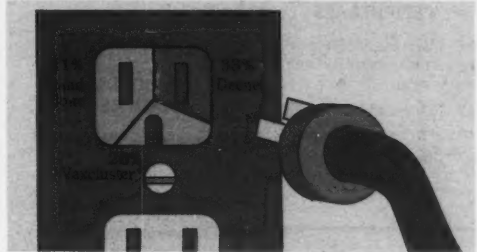
DEC devoted a hefty amount of Decworld floor space to network management in order to "let the marketplace know we've had this stuff a long time," said Ray Grenier, DEC manager

of network management product marketing and services.

Several DEC users expressed a strong interest in DEC's off-the-shelf software packages, which were designed  
*Continued on page 15*

### Plugging in

*The majority of large VAX systems in the U.S. are linked in networks*



\* Vaxclusters require Decnet

INFORMATION PROVIDED BY COMPUTER INTELLIGENCE  
CW CHART: AMY J. SWANSON

## It's Basic: Language to joust with macros in OS/2's arena

BY DOUGLAS BARNEY  
CW STAFF

REDMOND, Wash. — Basic will not only serve as the batch language for Microsoft Corp.'s OS/2 and Presentation Manager but will also evolve into a general-purpose macro language that will compete against others such as that in Lotus Development Corp.'s 1-2-3, according to Microsoft officials.

The firm used the kickoff of Quickbasic 4.0, a language product, to explain its far-reaching Basic strategy intended to extend the popular language's life into the next generation of MS OS/2 and the Presentation Manager.

While Quickbasic offers many features never before found in Basic, a further-refined product will serve as the batch language for MS OS/2 and the Presenta-

tion Manager. "The [existing] batch language is running out of steam and does not know about Presentation Manager stuff," said Steve Ballmer, vice-president of systems software at Microsoft. Quickbasic is not yet available as a development environment for MS OS/2, but a Basic compiler will eventually be available for that operating system, officials said.

Over time, Microsoft intends to position Basic as a general-purpose macro language. If the firm succeeds, users will be able to use one language to create routines that work with a variety  
*Continued on page 133*

## IN THIS ISSUE

**Sun shines.** Sun last week reported sales growth in its first fiscal quarter and introduced a CASE environment that networks multiple developers. Today, the company is expected to agree to license its 32-bit RISC architecture to AT&T. Pages 4, 8, 10.

**Storm ahead?** ETA adds air-cooled ETA10 processors, which it says fill the gap between near-supercomputers and supercomputers and might threaten Cray, DEC and Convex systems. Page 6.

### NEWS

**4** IBM shows gains, but not on DEC.  
**6** Alliant rolls out parallel processor.  
**7** Ashton-Tate provides Dbase users with access to System/36 files.

**8** AT&T shifts sales group to Data Systems operation.

**10** Vendors rally to promote Arcnet as international standard.

**14** Chips and Technologies readies Micro Channel chip set.

**14** Quadram develops low-cost emulation card for PS/2 models.

**14** Service program aids information center managers.

**16** Informix, Innovative plan merger.

**16** Wordperfect demonstrates PC DBMS at PC Expo.

**17** NEC completes move to Unix with four systems introductions.

**17** Kodak uses Teflon to protect floppies.

**18** Gates sees graphical interfaces in most PC users' futures.

**18** CCIA supports Air Force in Unix procurement.

**18** Two IBM scientists awarded Nobel Prize.

**133** Pactel files proposal to enable Bell companies to provide consumers a variety of services.

**133** Esber states intent to protect Dbase.

**134** Pick operating system works with PS/2 series.

### SOFTWARE & SERVICES

**25** On-line transaction processing systems mushrooming.

**25** Unisoft announces CICS link for Unix.

**25** Cortex CASE tool turns diagrams into code.



Correlating performance and capacity. Pullout section.

### MICROCOMPUTING

**37** Digital Research powers up Concurrent DOS 386.

**37** Excel groundwork bears third-party product fruit.

### NETWORKING

**53** 3M launches million-dollar ISDN project.

**53** Fiber-optic system links LANs.

**53** MNP's role as a standard still an issue.

### SYSTEMS & PERIPHERALS

**67** Motorola 68030 finds support in General Automation system.

**67** Emulex adds 655M-byte disk.

**67** Opus subsystem makes PC AT a workstation.

### Quotable

*"If you go out and sell too soon, you create expectations that you may not have the manpower and infrastructure to deliver; you could have sharpshooters working against you."*

ELAINE BOND  
CHASE MANHATTAN BANK

See story page 95.

### MANAGEMENT

**95** Consortium of DP training sponsors succeeds in Indianapolis.

**95** Profile: Chase Manhattan's first woman senior VP.

### COMPUTER INDUSTRY

**105** Vendors report mixed quarterly results.

**105** Conservatism pays off for Micropolis... so far.

**105** McDonnell Douglas revamps unprofitable sector.

### COMPUTER CAREERS

**116** Airlines looking for DP skills.

### SPOTLIGHT

Expert systems lend a hand with capacity planning.

### Pullout section.

### IN DEPTH

**75** Only corporate culture still requires all serious computing to be run on a mainframe. By Fred Viskovich.

**87** What if you found out your "tube" was affecting your behavior — even after work? By Tim Lynch.

### OPINION & ANALYSIS

**21** Lecht welcomes supercomputing's latest addition.

**25** Babcock watches ADAPSO vets fight IBM.

**37** Barney examines Microsoft's new Excel.

**53** Davenport wants to educate telecom execs.

**67** Connolly fights the System/38 current.

**95** Zwank advocates information law.

**105** Wilder wonders who's piloting the IBM liner.

### DEPARTMENTS

**20** Editorial

**102** Calendar

**126** Buy Sell Swap

**134** Inside Lines

## NEWS

# Microsoft Intermail buy starts work group push

BY STEPHEN JONES  
CW STAFF

REDMOND, Wash. — Attempting to stake a claim in the emerging desktop communications market, Microsoft Corp. last week acquired Intermail, an electronic mail program for Apple Computer, Inc.'s Macintosh.

Microsoft will reportedly begin marketing the product as Microsoft Mail in December at an as yet undisclosed price. Developed by Interactive Network Technologies, Inc., Intermail currently ranges in price from \$299.95 for work groups of one to four users to \$949.95 for groups of 21 or more.

The software allows users to send and receive messages, graphics and entire files electronically over Apple's Appletalk network. It also features background server operation, multiple zone support and network management facilities. Microsoft said it will encourage third-party software developers to use Intermail's open architecture as a foundation for future connectivity products.

**Enhanced version to come** Microsoft will also design versions that support Ethernet and personal computer-based systems in 1988, according to John Morey, product manager for Microsoft's integrated office systems group.

An enhanced version of the product, which is expected to feature connectivity between Mac networks over Appletalk and customized directory listings for users, will be released next year, Morey said.

Microsoft said it sees Intermail as an entry into developing what it called integrated office systems. Morey said such systems will feature Microsoft Mail running with Microsoft applica-

tions like Word on desktops with Intel Corp. 80386-based servers. The connectivity features of Microsoft Mail, he claimed, will help Macintoshes and PCs talk to one another.

Underlining its seriousness about development of the E-mail package, Microsoft has named Bob Matthews, a key developer of the company's Windows, to spearhead the design team.

### No big deal

Some analysts, however, downplayed the importance of the Intermail announcement. "There aren't enough Macs on networks today to make the acquisition that big of a deal right now," said Bruce Johnston, an analyst with First Boston Corp. in New York.

"The fastest growing element of the electronic mail market is in local-area network-based microcomputers, so Microsoft is doing the right thing," said Krystyna Flis-towicz, an analyst with Dataquest, Inc.

As part of the acquisition, Microsoft signed Intermail developer Nick Holt to a one-year, renewable consulting contract. Steve Ullman, who helped design Intermail, reportedly will provide consulting services on a six-month, renewable basis.

The Intermail package already competes with Inbox, an electronic mail program from Think Technologies, Inc., which was recently acquired by Cupertino, Calif.-based Symantec Corp. Analysts said competition will heat up as Microsoft puts its financial muscle behind the development and marketing of new Microsoft Mail products.

That does not seem to bother Symantec, though. "Microsoft can't possibly be all the solutions to all the people," said Spencer Leyton, vice-president of business development for Symantec.

# DEC raises server capacity

BY ELISABETH HORWITT  
CW STAFF

MERRIMACK, N.H. — Digital Equipment Corp. last week targeted large, multivendor installations with Decserver 500, an Ethernet server that is said to support up to 128 asynchronous devices. The previous Decserver 200 model can only support up to eight connections.

The server is said to connect terminals, personal computers and printers to an Ethernet network using Decnet protocols. Workstations can also use the server to communicate and access peripherals locally, without

going over the main Ethernet network, DEC spokesman Mark Lederhos said. This allows corporations to provide networking to a large user population without overburdening the main Ethernet backbone, he pointed out.

While different Decserver 200 models must be used to support either DEC-423 or RS-232 devices, the Decserver 500 can support interface cards for both types of connection, according to DEC. Priced at \$15,250 and available immediately, the Decserver 500 provides increasing per-port cost savings over the 200 model as the number of devices increases.



# KnowledgeWare announces two new *CASE* tools

## 1 New *Planning Workbench* helps link systems plans to business strategy

Includes:

- Matrix Diagram tool for showing lists of properties of objects or for showing associations between objects
- Decomposition Diagram tool for showing planning objects that have hierarchical associations
- Entity Diagram tool for describing high level entities

## 2 New *Design Workbench* makes process and data design faster and easier

Includes:

- Structure Chart tool for an overview of process design
- Action Diagram tool for detailed module design
- Data Structure tool for data declarations, records, relations, segments, and screens
- IMS, DBD, and PSB Design tools with control statement output
- Relational Database Design tools
- Flat File Design tools
- Screen tools including BMS and MFS generators

In the past year over 2,800 data processing professionals acquired the power of artificial intelligence in KnowledgeWare's systems analysis tool. Now you can apply the same comprehensive capabilities to the planning and design stages of application development.

The Planning Workbench, Analysis Workbench, and Design Workbench can all be installed on a PC-AT or PS/2. All three tools share a common repository—the KnowledgeWare Encyclopedia—which coordinates knowledge from all parts of the development effort.

These tools use a mouse to create, revise, and manipulate diagrams... then automatically check diagrams to see if they are correct, complete, and consistent. Ideally, you will use the work you have done on one tool as input to the next. But each can be used as a stand-alone tool, so you only buy what you really need. And you can start application development wherever you want...with planning, analysis, or design.

No matter how application development is done in your organization, KnowledgeWare has the power tools you need to develop higher quality systems faster, and reduce costs.

Call 1-800-338-4130 now for more information

To find out how you can get started using these time-saving tools, call and ask for Steve Kahan (In Georgia, call 404/231-8575). Or fill in and mail the coupon below.

### Special offer for current customers

If you already have our Analysis Workbench, ask about our customer discount. This special offer is available for a *limited time*, so call today.



## KnowledgeWare

*The world's most  
comprehensive CASE tool set*

KnowledgeWare software products are distributed outside the U.S. by Arthur Young International member firms. PC-AT and PS/2 are trademarks of International Business Machines.

.....

I am interested in the following KnowledgeWare products:

☐ Planning Workbench   ☐ Analysis Workbench   ☐ Design Workbench   ☐ Mainframe tools

Name \_\_\_\_\_ Title \_\_\_\_\_

Company \_\_\_\_\_ Phone (     ) \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

KnowledgeWare, Inc., 3340 Peachtree Rd., NE, Suite 2900, Atlanta, Georgia 30026

.....

# IBM profits turn up at last

Firm posts 12% increase after slogging through six declining quarters

BY CLINTON WILDER  
CW STAFF

IBM showed signs last week of its long-awaited business turnaround, halting six straight quarters of earnings declines with a 12% year-to-year profit increase. But that third-quarter performance still lagged well behind Digital Equipment Corp.'s 48% profit leap and Amdahl Corp.'s fivefold earnings increase.

IBM's earnings of \$1.21 billion showed the best percentage increase since the fourth quarter of 1985, when the firm benefited from a massive year-end ramp-up of its 3090 mainframes. But IBM's pretax operating income of \$1.56 billion in the quarter ended Sept. 30 was virtually the same as year-earlier levels, dampening enthusiasm for the results.

"IBM is not out of the woods, by any stretch," said Stephen Smith of Paine Webber, Inc. "There are still major problems to be addressed. But order momentum seems to be building."

Drexel Burnham Lambert, Inc.'s Peter Labe said the growth of new orders exceeded 10% for the first time in two years.

## Big fourth quarter seen

Most analysts said they were optimistic that IBM will report a strong fourth quarter, based on expected shipments of the company's 9370 processors, 3090E series mainframes, new 3380 disk drives and high-end models of the Personal System/2.

"Everything points to a big fourth quarter, and IBM has been telling analysts to maintain their full-year forecasts," Labe said.

"It is typical for CPU vendors to do 40% of their earnings in the fourth quarter, when users are spending all of their budgets out of fear that they won't get the same budget next year," he explained.

In the fourth quarter, "the 9370 will begin to kick in, at least within IBM's current customer base," Smith said. "It's not the [DEC] VAX killer that everyone was talking about, but 4,000 units in the quarter would be \$1 billion in revenue, so it's still a significant factor."

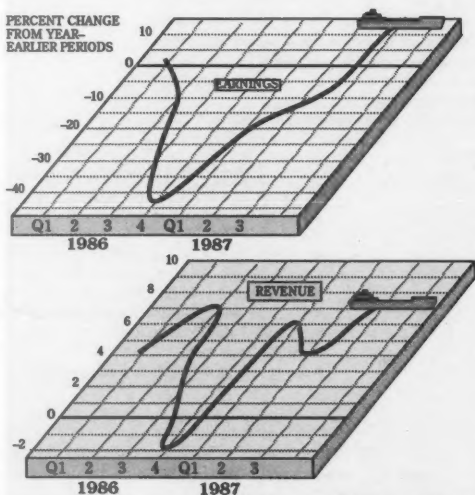
In the third quarter, IBM's bottom line benefited by one-time gains from favorable for-

slow," said Michael Geran of E. F. Hutton & Co. "They're still feeling pricing pressure on their older products and seeing only a gradual ramp-up of new products."

Revenue for the quarter rose to \$12.73 billion from \$11.91 billion a year ago. Per-share earnings reached \$2, up from \$1.76 in the third quarter of 1986.

## Turning the ship around

IBM's quarterly earnings picture improves for the first time in 18 months



CW CHART: AMY J. SWANSON

eign currency translations, the sale of Intel Corp. stock, tax provisions that were 2% lower than 1986 levels and the comparison with a dismal year-earlier quarter when profits plunged 27%.

Despite IBM's much-publicized expense controls, the rate of its cost increases still outpaced its revenue growth, 8% to 7%.

"The transition has started, but the rate of change is quite

One unusual factor in the results was a 1% decline in IBM's maintenance revenue. The drop reflected IBM's Corporate Service Amendment price cuts that took effect June 1, although the growth rate of service revenue slowed considerably in the first two quarters. The increasingly competitive segment has grown just 5% for the first nine months of the year, compared with 21% in 1986 and 16% in 1985.

"Both IBM and DEC have realized that maintenance is one of their best competitive weapons," Smith said.

Maynard, Mass.-based DEC reported first-quarter revenue of \$2.53 billion, a 24% increase from \$2.04 billion a year earlier. Profits increased to \$269.9 billion, or \$2.03 per share, up from \$182.6 million, or \$1.37 per share.

## DEC a 'steady earner'

The results were in line with most analysts' expectations, which in itself was unusual.

"For a long time, DEC would always surprise us on the downside, then they had six quarters in a row exceeding expectations," said Susie Peterson of First Boston Corp. "Now, people will have to get used to DEC just being a steady earner."

DEC increased its spending significantly in several areas during the quarter, including the addition of 3,600 employees for a worldwide total of 114,000. Noting DEC's no-layoff policy, Peterson said the increased work force "could be worrisome" for DEC's bottom line if the company's sales begin to stall.

## Amdahl reaches for stars

Meanwhile, Amdahl Corp. continued its stellar year with an outstanding third quarter, reporting a more than fivefold surge in profits on sales that grew 65%.

Revenue rose to \$362.7 million from \$220 million a year earlier. Net income was \$36.8 million, or 69 cents per share, compared with \$7.1 million, or 15 cents per share.

For the year's first nine months, the Sunnyvale, Calif., plug-compatible mainframe maker's profit was \$93 million, compared with \$12.2 million in the same period in 1986.

Although Drexel Burnham's Labe predicted that Amdahl's growth rate will slow in 1988, he said he expects revenue increases of 20% to 25%.

"IBM will have a major announcement in February, but we think Amdahl has an answer," he said.

## COMPUTERWORLD

**Editor in Chief**  
Bill Luber  
**Executive Editor**  
Paul Gillin

**News Editor**  
Peter Bartolik

**Senior Editors**  
James Connolly, Systems  
Elisabeth Horvitt, Networking  
Charles Babcock, Software  
David Ludlum, Management  
Douglas Barney, Microcomputing  
Patricia Keefe, Networking  
Ed Scannell, Microcomputing

**Senior Writers**  
Rosemary Hamilton  
Stanley Gibson

**Staff Writer**  
Alan J. Ryan

**New Products Editor**  
Suzanne Weizel

**Features Editor**  
George Harrar

**Senior Editors**  
Janet Fieder  
Glenn Rifkin  
Joanne Kellher  
Amy Sommerfeld Fiore

**Associate Editor**  
Deborah Fickling

**Assistant Editor**  
Kelly Shea

**Senior Writer**  
Michael L. Sullivan-Traior

**Researcher**  
Sally Cunack

**Assistant Researcher**  
Bonnie MacNeil

**Intern**  
Jeff Goodwin

**Managing Editor**  
Donovan White

**Chief Copy Editor**  
Patricia Heil Erickson

**Assistant Chief Copy Editor**  
Steven M. Ulfelder

**Copy Editors**  
David W. Bromley  
Mary Grover  
Martha E. Ruch  
Sharon Baker  
Laura O'Connell  
Marie T. Burke  
James Daly

**Design Editor**  
Marjorie Magowan

**Graphics Editor**  
Mitchell J. Hayes

**Graphics Assistant**  
Amy J. Swanson

**Graphic Designer**  
P. Charles Ladouceur

**Assistant to Editor in Chief**  
Theresa Gallant

**Editorial Assistants**  
Patricia Faherty  
Christie Sears  
Linda Gorgone

**Rights and Permissions Manager**  
Nancy Shannon

**News Bureau**  
Mid-Atlantic  
201/967-1350

Alan Alper, Correspondent

Washington, D.C.  
202/347-6718

Mitch Betts, Correspondent

West Coast  
415/347-0555

Kathy Chin Leong, Manager

Julie Pitta, Senior Correspondent

James A. Martin, Correspondent

Stephen Jones, Correspondent

Mary Elliston, Editorial Assistant

Midwest  
312/827-4433

Jean S. Bosman, Correspondent

IDA News Service  
Kathleen A. Gow, Director

Main Editorial Office  
Box 9171, 375 Cochituate Road  
Framingham, MA 01701-9171  
617/879-0700

# Apple, Sun hit MIS hard, score quarterly profit victories

BY CLINTON WILDER  
CW STAFF

Apple Computer, Inc. and Sun Microsystems, Inc., two of the year's most notable vendors for penetrating the corporate MIS market, both reported strong financial gains in the quarter ended Sept. 30.

Cupertino, Calif.-based Apple surpassed analysts' predictions by more than doubling its fourth-quarter profits on sales that surged 54%.

Sun, the technical worksta-

tion vendor in Mountain View, Calif., continued what has become its standard growth as sales and net income both approximately doubled in its first fiscal quarter.

Apple reported profits of \$71.7 million, or 54 cents per share, up from \$32.9 million, or 25 cents per share, a year ago. Sales reached \$786.4 million, compared with last year's \$510.8 million.

Apple has been increasing personal computer market share in both its Macintosh and Apple

II product lines, according to Hambrecht & Quist, Inc. analyst Bruce Lupatkin.

## Mac II takes on IBM PC

"Although some Mac II sales are going for nontypical PC uses like desktop publishing, that number pales beside those for general-purpose workstations that would otherwise have been IBMs or IBM compatibles," Lupatkin said.

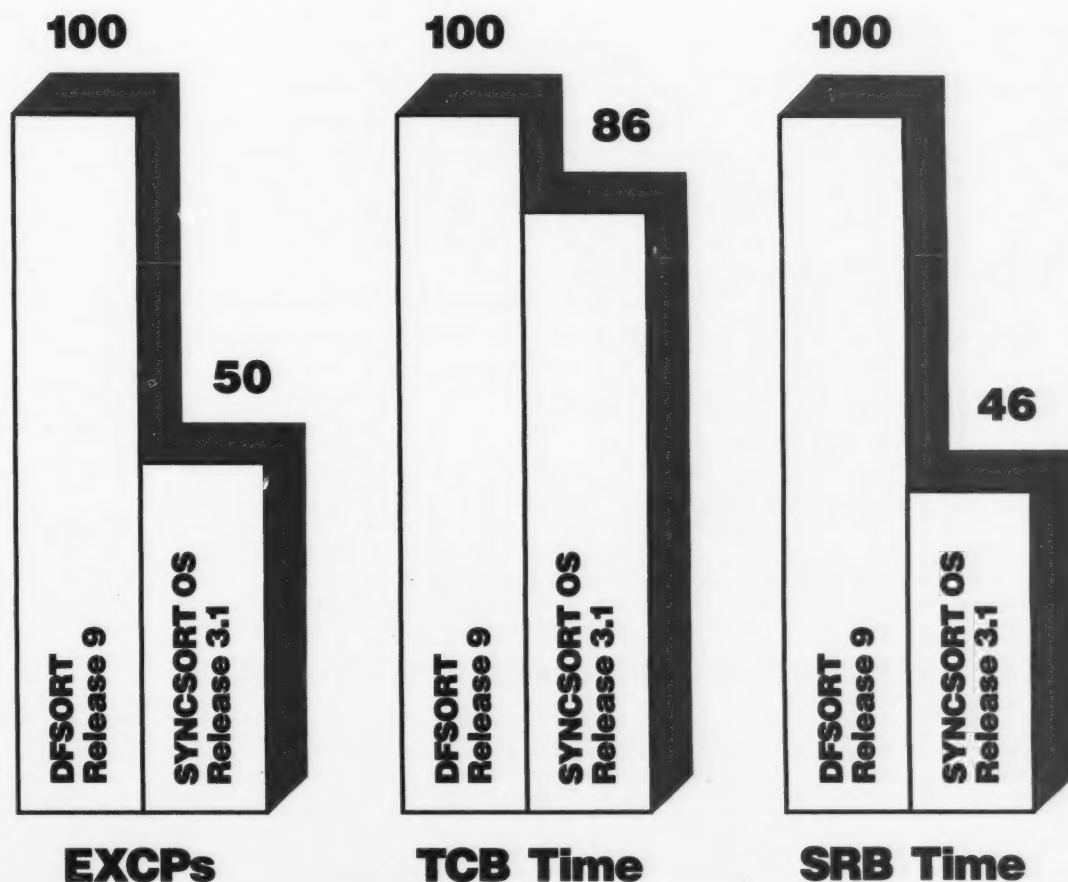
"And 45% of Apple's sales came from the Apple II, so they haven't lost any share there,"

Lupatkin added.

For fiscal 1987, Apple's revenue reached \$2.66 billion, a 40% gain over fiscal 1986's \$1.9 billion. Profits followed the same pace, growing 41% to \$217 million, or \$1.65 per share.

Sun said the unexpectedly strong growth of its low-end Sun-3/50 and Sun-3/60 workstations contributed a sizable portion of its sales in the quarter. Revenue grew 108% to \$191.7 million, and earnings gained 92% to \$12.9 million, or 36 cents per share.

# **SYNCSORT OS** **VS.** **DFSORT**



## **NEED WE SAY MORE?**

Why just talk about it? Experience this performance for yourself. To arrange for a test of SyncSort OS on your system, call us at (201) 930-8200.

**syncsort**

**THE BEST OF SORTS.™**



# ETA extends supercomputer line down

BY JAMES CONNOLLY  
CW STAFF

**NEW YORK** — The supercomputer arm of Control Data Corp., ETA Systems, Inc., last week filled out its product line with two low-end processors and, in doing so, claimed to have created a class of technical systems.

ETA positioned the air-cooled models of the ETA10 series in what the company said is a gap between near-supercomputers and supercomputers, including high-end ETA10 systems introduced in April and delivered to two customers.

Some analysts were skeptical about the appeal of the sub-\$1 million ETA10 Model P and \$1.2 million ETA10 Model Q because of their inability to run Unix until next year. But those same observers noted that ETA's move may force other companies to take a closer look at the price/performance ranges served by the new ETA models.

Among those who might be affected by ETA's announcement are Cray Research, Inc., Digital Equipment Corp. and near-supercomputer makers Alliant Computer Systems Corp. and Convex Computer Corp.

ETA claimed the new models outperform supercomputers like the Cray X-MP by providing peak performance of up to 947 million floating point operations per second (MFLOPS) and correspondingly high benchmarked performance ratings. The ETA10 Model P achieved a rating of 25 MFLOPS and the ETA10 Model Q achieved a rating of 62 MFLOPS running 64-

bit Linpack 100 by 100 arrays.

The new ETA processors are priced at \$850,000 for the Model P and \$1.2 million for the Model Q, compared with \$2.5 million for an entry-level X-MP. Base prices range from \$100,000 to \$450,000 for most vendors' near-supercomputers, which ETA claimed provide significantly lower performance than its new models.

Thomas C. Roberts, president of CDC's Computer Systems and Services Group, claimed none of the supercomputer or near-supercomputer vendors serve the market targeted by the new ETA models. "I think we have a very comfortable lead," Roberts said.

He said half of the processing power growth in the supercomputing field in recent years has been in the near-supercomputer market. But he claimed those systems fail to meet users' needs for growth paths.

## In reply

Analyst Michael Geran of E. F. Hutton & Co. in New York speculated that DEC, Alliant, Convex and several makers of parallel processors might answer ETA with their own systems. However, he and analyst Gary Smaby of the Minneapolis investment firm Piper, Jaffray & Hopwood, Inc. noted that Cray would have to change its philosophy of targeting the high end of the supercomputing market if it wanted to address ETA's low-end products.

"Cray wouldn't sell a \$3 million X-MP/14SE if the customer wasn't eventually going to buy a

\$10 million X-MP," Smaby said. He noted that the marketing costs related to selling a supercomputer, which he said Cray has estimated at \$500,000, raise a question of how successful ETA will be in selling low-end

ter of 1988. "This box without Unix is like a ship without sails," he said.

"They've got an interesting plan here, but where's the software?" Geran asked.

ETA officials claimed that

## Cool front

Air-cooled ETA10 Models P and Q are claimed to offer supercomputer performance at a much lower cost than the more traditional Models E and G

Model	P	Q	E	G
Cycle time (nsec)	24	19	10.5	7
Processors	One to two	One to two	One to four	Two to eight
CPU memory (bytes/CPU)	32M	32M	32M	32M
Shared memory (bytes)	64M-512M	64M-512M	256M-1G	512M-2G
Peak performance (FLOPS) <sup>1</sup>	750M	947M	3.4G	10.3G
Cooling	Air	Air	Liquid nitrogen	Liquid nitrogen
Maximum number of I/O units	Four	Four	Nine	18
Base price	\$850,000	\$1.2M	\$5.5M	\$8.9M

<sup>1</sup> Floating-point operations per second

INFORMATION PROVIDED BY ETA SYSTEMS, INC.

ETA10s through CDC's existing sales organization.

He said success by ETA could force Cray to reevaluate its high-end orientation.

"I think this does open a new market, in that there are customers who have been in the closet and wanted a supercomputer but couldn't afford it," Smaby said.

But he also cited a potential problem for the ETA10s in that ETA's Unix implementation will not be ready until the third quar-

ter of 1988. "This box without Unix is like a ship without sails," he said.

One of the first customers to order one of the new models reported that having Unix available might help. But he said porting his existing software to EOS should be no more difficult than moving it to any other system.

Iain B. Findleton, chief of the Dorval, Quebec, computer center for Environment Canada At-

mospheric Environment Service, said he expects delivery of a dual-processor ETA10 in March 1988. He said the service, Canada's primary weather forecasting organization, now runs a combination of Cray and CDC systems.

The ETA10 "has the same performance as a Cray-1 — even a little bit more power — and we can bring it in on wheels and plug it into a 60-Amp., 220V outlet," Findleton said. He said a utility company had to run special power lines when the weather service installed its first Cray.

The new ETA10 models use the same single-processor board as the original ETA10. They have slower clock speeds, however, (24 nsec for the Model P and 19 nsec for the Model Q) and are cooled by air rather than by liquid nitrogen.

In announcing the Models P and Q, ETA also designated the original 10 $\frac{1}{2}$ -nsec ETA10 as the Model E and a 7-nsec system due next year as the Model G. ETA has projected a peak performance rate of 10 billion FLOPS for the eight-processor Model G.

ETA compared the new models to departmental systems that operate in an office environment and demonstrated a Model P at the introduction. But while the CMOS-based processor ran without air-conditioning, its disk drives ran in an adjoining air-conditioned area because high-capacity disks for office environments will not be ready for ETA's use until early 1988.

The Model P is available now with one CPU. A dual-CPU Model P and the Model Q, with one or two CPUs, will be available in 1988. Each new model supports 8M to 16M words (64M to 128M bytes) of shared memory.

# Alliant seals performance hole with new minisuper

BY STANLEY GIBSON  
CW STAFF

**LITTLETON, Mass.** — Seeking to regain momentum in the minisupercomputer field, Alliant Computer Systems Corp. is scheduled to announce today a new parallel processor priced starting below \$100,000.

The FX/4 fills a performance gap between Alliant's FX/1 and FX/8 machines and is the spearhead of an effort to renew growth at the 5-year-old company, Alliant officials said. The new machine is slated to be shipped before the end of the year.

"This is the rollout of a new strategy, including a new family of machines with processors below the FX/4 in performance as well as above it," said Ronald Gruner, Alliant's president. He declined to say when the other products would be announced. Gruner added that Alliant will offer new software products and will begin direct sales in some in-

ternational markets.

Recently, Alliant's profits have been below projected figures, resulting in a sharp slide in the price of the company's publicly traded stock. Alliant has grown at a rate of about 7% during the past nine months, according to Gruner, a much slower rate than previously.

The FX/4 is a one- to four-processor system that uses the Motorola, Inc. VMEbus and is fully compatible with Alliant's other models, according to Gruner. A single-processor version can perform 11.8 million floating point operations per second (MFLOPS), while a four-processor version can perform at a peak rate of 47.2 MFLOPS. A system with one computational processor, one I/O processor, 32M bytes of memory and 550M bytes of disk storage carries a \$99,900 price tag.

The FX/4 will fill a need as a sort of "personal minisupercomputer," according to Vicki

Brown, an analyst at International Data Corp. in Framingham, Mass. A highly paid engineer would be very interested in using the FX/4 as a dedicated processor, she predicted. An Alliant FX/8, in contrast, would more likely be shared by a number of users on a network.

Brown pointed to large companies, including aerospace giants Boeing Co. and Hughes Aircraft Co., as likely purchasers of the new system.

## Demand to grow

Gruner predicted that pricing a minisuper like the FX/4 below \$150,000 will cause an immediate increase in demand.

Brown concurred, saying the FX/4's price would induce engineers to buy the machine. She said the FX/1 has been outselling the FX/8 at a rate of 4-to-1. "That shows there is a lot of demand at the low end. But the FX/4 lets you grow too."

An FX/1, which starts at

\$99,500, is capable of 11.8 MFLOPS, like the FX/4. However, the FX/1 cannot grow beyond one processing board.

The base model FX/8 also starts at 11.8 MFLOPS, but it can grow to contain eight processors. The FX/8 starts at \$285,000.

Alliant did not change the prices of its FX/1 and FX/8 systems, despite the possibility that they will be replaced within the next several months.

Brown suggested that the FX/4 essentially replaces the FX/1 because of the nearly identical price and comparable computing power for an entry-level system. Only a user with no intention to expand would purchase an FX/1, she said.

Gruner said Alliant will take over direct sales from Apollo Computer, Inc. in some foreign countries. Apollo had served as Alliant's foreign distributor. Although Apollo will continue that role in some markets, Alliant

said it will be taking charge of its own efforts in West Germany, France, the UK and Japan.

Alliant also announced enhanced compiler and algorithm products.

Alliant's moves are geared toward renewing the company's vigor in an increasingly crowded market, according to Gruner. "Market share is the real objective," he said.

Assuming that Alliant's performance claims are accurate, Brown said the FX/4 offers higher performance for a lower price than machines from competing vendors like Convex Computer Corp. Convex, however, is expected to announce a new line of systems in December or January.

Drawing a parallel with the technical workstation market, Brown said Convex will be analogous to Apollo, concentrating on higher priced, higher performance systems. Alliant, on the other hand, will be similar to Sun Microsystems, Inc., focusing on lower cost, higher volume systems, she concluded.

# Ashton-Tate ties Dbase to System/36 use

BY DOUGLAS BARNEY  
CWA STAFF

TORRANCE, Calif. — In an effort to woo the more than 60,000 IBM System/36 users, Ashton-Tate last week announced a product that allows microcomputer users to access System/36 data files.

The product, called Dbase Direct/36, provides Ashton-Tate Dbase III Plus users with access to active System/36 files, which can also be downloaded to the microcomputer.

The package costs \$1,695 per System/36 CPU, resides on the micro and provides extensions to the Dbase language.

According to Ashton-Tate product manager of connectivity

loading them to a PC."

Another user agreed. "The idea of downloading to a PC is what we want to do. We are very interested in looking at it," said Dennis M. Klinger, vice-president of MIS at Ryder Truck Rental, Inc., which has a Sys-

tem/36 with approximately 30 IBM Personal Computer ATs attached.

But Rodger Peck, president of the Peck Systems Group, a System/36 consulting firm, had reservations.

"I don't know if I want some-

one with PC intelligence playing with my files. You need to protect down to the field level," he said. "Security is always a problem in working with a host data file. Someone can walk away with a floppy disk."

Dbase Direct/36 works with

any System/36 that uses IBM's SSP Release 5, has IBM's PC Support/36 installed and uses the Interactive Data Definition Utility. The product further requires an IBM PC or compatible, IBM's Enhanced 5250 terminal emulation or a compatible package and Dbase III Plus.

Dbase Direct/36 does not work with so-called Dbase clones, Walker said.

**T**HE PRODUCT provides an incentive for MIS professionals to view Dbase as an applications development tool, according to Ashton-Tate.

Dwayne M. Walker, the user can also perform selective data extraction. "You only bring down what you work with, which cuts down on network traffic," he said.

## Normal setup

The typical implementation would consist of the application and data manipulation functions residing on the microcomputer, with the data housed on the System/36.

"This lessens the burden on the System/36 processor," Walker argued. System/36 files appear to the user as Dbase files and are reformatted into the .DBF file format.

Dbase Direct/36 is especially handy for applications in which the same data needs to be accessed by both microcomputers and terminals. According to Walker, the product also provides an incentive for MIS professionals to view Dbase as an applications development tool.

## Warm reception

Users contacted last week generally applauded the concept behind Dbase Direct/36, especially given the low level of data base capability currently offered on the System/36.

"I would be interested in that product. The 36 does not have the data base capabilities of the System/38," said Michael J. Froggatt, MIS manager at S. L. Industries, Inc. "I can see the benefits of pulling general ledger or personnel records and down-

The largest single issue newspaper ever published was the 946 page, 7½ lb. issue of the N.Y. Times on Oct. 17, 1965. . . \*

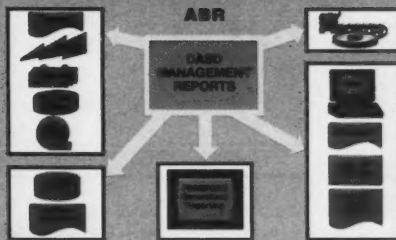
That's a lot of reporting... but it's nothing compared to the reports you get with ABR.

ABR is capable of generating a wide range of reports for the DASD Management user. Extensive TSO/ISPF panels are supplied.

**NEW FLEXIBLE REPORTING**-ABR supports a very flexible set of commands and panels for both dataset selection and the fields to be displayed. The user can select datasets by any qualifier or characters within the name. In addition, any field contained in the VTOC, Catalog or ABR system can be used as a selection criteria. Example: Select all datasets containing a 3 character first level qualifier starting with S and an index level of TST anywhere and the size of the dataset is over 100 tracks. **XSELECT XDSN=S//.\*\*TST\*\*, SIZE > 100**

So, whether or not your reporting needs are of world record proportions... call Innovation and we'll send you a Free No Obligation 90 Day Trial of our DASD Management system... and you will receive Free, the deluxe 1987 Guinness Book of World Records.

\*Reference Guinness Book of World Records ©1986



Available for IBM, OS, VSI, MVS and MVS/XA

**INNOVATION**  
DATA PROCESSING

Innovation Plaza, 275 Paterson Ave., Little Falls, NJ 07424 • (201) 890-7300

# AT&T reorganizes sales team

*Invigorates push into MIS market with 1,000-person transfusion*

BY ALAN ALPER  
CW STAFF

NEW YORK — AT&T said last week it will provide its Data Systems organization with a dedicated sales group with skills appropriately matched to sell computer and related equipment to data processing professionals.

Effective Jan. 1, AT&T is scheduled to shift its 1,000-member National Data Sales Organization from its Business Markets Group, which handles both voice and data products, to its Data Systems operation.

The transfer of the computer sales force is the latest in a string of shifts taking place during the firm's three-year foray into the computer business. For the first time, AT&T will have an organization selling computers directly to business customers.

## Change in status

In a related move, the Data Systems division was elevated last week to "Group" status under

AT&T's top computer executive, Vittorio Cassoni.

Cassoni, who was promoted from executive vice-president to president, had reported to Business Markets Group President Sam Willcoxon but will now report directly to Randall Tobias, AT&T's vice-chairman.

AT&T said the National Data Sales Organization will be separated from the Business Markets Group because the skills and expertise required to sell computers to DP professionals differ from those needed to handle customer premises equipment such as telephone and private branch exchanges.

"The complex needs of data customers require dedicated, specially trained sales people," Willcoxon noted in a prepared statement.

The transfer of the sales organization to the Data Systems Group will make sales personnel more accountable to Cassoni and his data networking mission, a spokeswoman said.

The Data Systems sales organization will continue to work with the Business Markets Group's other telecommunications-related end-user sales groups, she noted.

"The company will continue to maintain a single point of contact for large business customers through the Business Markets sales force," Cassoni said in a prepared statement. "The Data Systems sales organization will work as part of these AT&T account teams to sell data products within integrated communications and data systems solutions or to sell them separately, whichever is appropriate for each customer."

## No surprise

Analysts last week were not surprised by the moves. Cassoni has publicly lobbied for a dedicated Data Systems sales force as a prerequisite for making AT&T's computer business profitable. AT&T lost more than \$1 billion on its computer operation last

year, industry analysts estimated.

"AT&T is trying one more time to make it in computers, and they feel Cassoni has the potential to pull it off," said one analyst who requested anonymity. "He's always complained that he didn't have a sales force that was accountable to him, and now that's been rectified."

Cassoni joined AT&T almost a year ago from Ing. C. Olivetti & Co. in what many analysts believed was a last-ditch effort to salvage AT&T's participation in computers.

While Cassoni recently said he is cutting AT&T's Data Systems' losses, the firm, as a matter of policy, does not break out Data Systems' results.

In a related move, AT&T's Customer Programming Services Centers, which have functioned under AT&T's Network Operations Group and provide custom DP software, reportedly will be transferred to the Data Systems Group next year.

At the same time, product management and modern development will be transferred from the Data Systems Group to AT&T's Communications Systems division.

# AT&T, Sun to shake on RISC pact

BY ALAN ALPER  
CW STAFF

NEW YORK — AT&T is expected today to reveal an agreement to license a Sun Microsystems, Inc.-developed reduced instruction set computer (RISC) architecture that AT&T intends to use as the platform for its next generation of high-performance workstations, sources close to both companies said last week.

Sun unveiled a 32-bit RISC architecture called Sparc, which stands for scalable processor architecture, when it introduced its Sun-4/200 family of workstations and network servers this summer [CW, July 13]. At that time, officials of the Mountain View, Calif., firm said the company would license the technology, operating system and related development tools and compilers to semiconductor and other systems manufacturers in hopes of making Sparc an industry-standard platform.

Sun and AT&T officials declined to comment on reports regarding the licensing of Sparc. John Hime, Sun's market director of hardware, said his firm expects a number of companies to commit to Sparc during the next six months. Sun, he said, is not worried that it is adding to the competitiveness of other workstation vendors by licensing Sparc. "For 5½ years, we've used the same CPU as all of our competitors, and we've done quite well," he said.

## Little risk

Scott McNealy, Sun's president and chairman, said there is little risk in licensing RISC technology. "Licensing implies royalties," he said. "Even if you lose, you win."

In striking a licensing deal with AT&T, Sun would be embracing a nonthreatening partner that, to date, has not fared particularly well in the computer industry, analysts said last week.

"If Sun and AT&T sign such a deal, it is a positive endorsement of the Sparc architecture," noted Bob Herwig, an analyst with Hambrecht & Quist, Inc. in San Francisco.

The Sun-4 family offers approximately 10 MIPS of computing power, which the company has said provides the performance of a Digital Equipment Corp. VAX 8800 at about one-tenth the price. An entry-level Sun-4/260 deskside workstation with 8M bytes of main memory lists for \$39,000.

West Coast correspondent Julie Pitta contributed to this report.

# Aging VSE

CONTINUED FROM PAGE 1

production-oriented shops — find multiple VSEs can handle their needs at a lower expense than MVS can, and they delay completing the migration. There were 3,138 IBM MVS/XA systems in 1986, or less than half the number of VSE systems, while the total number of IBM MVS/SP systems declined in 1986 to 4,632 from 5,510 the year before, according to Computer Intelligence.

Despite their large numbers, however, VSE users acknowledge that they are often handicapped by VSE's archaic procedures, particularly its method of lock-file management.

Jim Glasgow, manager of systems programming at Children's Hospital and Medical Center in Seattle, said his IBM 4381-14 was running at only 50% to 60% capacity due to lock-file contention as it processed the demands of five VSE systems running under VM. He said the contention was eliminated by installing Extend/VSE, a \$7,500 product from Goal Systems International, Inc. in Columbus, Ohio.

## 'Rolls-Royce price tag'

"Extend/VSE was one of the products we put in to try to avoid conversion to MVS," Glasgow said. "MVS is a wonderful product, but it's got a Rolls-Royce price tag."

Extend/VSE, Softkey, Vlock/VM from BMS Computer, Inc. in Walnut Creek, Calif., and Cache Magic LF, a \$5,000 product

from SDI in San Mateo, Calif., are among the products that address the lock-file problem associated with multiple VSE systems.

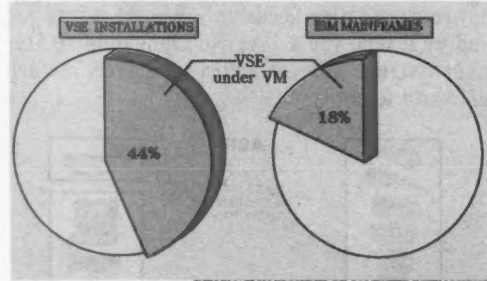
VSE typically creates multiple, time-consuming I/Os to disk each time a VSE user attempts to access a record. A lock file on a shared DASD controls access to all records, and a request for a record prompts VSE to generate

lock or an indication that "a record is in use when it's not," Storer's Woodward said. That fault is tied to the lock file's hashing technique that has no collision-avoidance algorithm, so when similar keys point to matching record numbers on different disks, a collision occurs that rejects one of those requests, he said.

Although the new products

## Big slice of the pie

Nearly half the systems using VSE as a primary operating system run it as a guest under VM



INFORMATION PROVIDED BY COMPUTER INTELLIGENCE  
CW STAFF

an instruction to the lock file to retrieve it. If the record is locked, the lock file rejects the request, and it goes into a brief wait until VSE can try again, explained John A. Rankin, Goal Systems' product manager for Extend/VSE.

Heavy contention results in frequent waits and a lot of wheel-spinning by VSE as it repeatedly tries to access a record. The situation is aggravated by the VSE lock file's ability to report a false

resolve this contention in different ways, they tend to take two basic approaches. Both Softkey and Vlock/VM add a module to the nucleus of VM that intercepts requests to the disk VSE lock file and steers them to a virtual lock file. Because that lock file is located in main CPU memory, it handles requests more quickly than accessing disks.

The Extend/VSE product requires no modifications to VM and, instead, uses an IBM Con-

versational Monitor System (CMS) virtual machine under VM as a server. The requests to disk are intercepted while still in VSE and carried via a channel-to-channel adapter to the CMS machine, which has no user terminal attached to it so it can serve as the lock-file manager, Goal Systems officials said.

SDI officials could not be reached for comment, but users who evaluated Cache Magic said it creates a lock file in the CPU cache.

## Solved problem

Robert Cron, technical support manager at Restaurant Enterprises Group, Inc. in Irvine, Calif., pushes 12 million to 15 million transactions a day through six VSE systems running under VM/High-Performance Option. Cron's department was experiencing a lot of DASD contention, which was resolved by installing Softkey.

"On the average, we're experiencing 22% improvement in throughput," he said.

Unlike many VSE users, Cron said he looks forward to converting to MVS but finds his staff of 15 tied up converting McCormack & Dodge Corp. applications to M&D's Millennium environment. "If the growth we're seeing continues, Softkey buys us more time to get to MVS. I would say it's bought us another year," he said.

David V. Lewis, VM and VSE systems programmer for West Coast Life Insurance Co., said his firm's use of Vlock/VM has saved 5% of CPU time for his three VSE systems.



# PDSFAST

## *It's About Time!*

### **PDSFAST Is About Time and Money Saved by Thousands of MVS Users in the Following Critical Areas.**

• DASD/SPACE Management-PDSFAST interfaces transparently with all existing DASD Management systems, reclaiming more space and saving up to 90% of the time and resources used. SPEAK TO ANY OF THE OVER 2,500 CONTRACTED PDSFAST USERS WHO, COMBINED, HAVE VIRTUALLY EVERY MAJOR DASD MANAGEMENT SYSTEM AVAILABLE, AND THEY WILL TELL YOU "No DASD management configuration is complete without PDSFAST."

DASD Management System used to compress 2,679 individual PDS's on 3380 Disk Pack.

<i>Without PDSFAST Interface</i>			
<i>Elapsed Time</i>	<i>CPU Time</i>	<i>EXCPs</i>	<i>Job Cost</i>
157 Min-32 Sec.	67 Min-41 Sec.	183,492	\$843.51

<i>With PDSFAST Interface</i>			
<i>Elapsed Time</i>	<i>CPU Time</i>	<i>EXCPs</i>	<i>Job Cost</i>
18 Min-11 Sec.	31 Sec.	8,299	\$ 29.87

• CICS/DATABASE Libraries — PDSFAST copies and compresses CICS and Database libraries in a fraction of the time presently used. Typical elapsed time for a copy or compress of screen libraries, and other similar datasets goes from about 40 minutes to under 1 minute. PDSFAST eliminates unnecessary system down-time spent waiting for copy and compress operations to complete.

• IEBCOPY/SPFCOPY — PDSFAST will replace all batch and interactive IEBCOPY and SPFCOPY/COMPRESS functions. PDSFAST will save over 80% of the time and resources presently used.

• SMP Processing — SMP and SMPE both dynamically invoke IEBCOPY thousands of times during a typical run. PDSFAST reduces SMP and SMPE run time and resource consumption by over 75%.

PDSFAST is now used at over 2,500 MVS installations worldwide. PDSFAST provides a competitive advantage for MVS installations of all sizes, saving many thousands of dollars in data center resources daily. PDSFAST is also saving thousands of individuals many hours of unnecessary time spent waiting for work to be completed.

### ***Isn't It About Time You Had The PDSFAST Advantage!***

For further information about PDSFAST,  
call Software Engineering of America at (516) 328-7000.

## **SEA**

SOFTWARE ENGINEERING OF AMERICA, INC.  
2001 Marcus Avenue, Lake Success, NY 10042

## Sun nets CASE environment

BY JULIE PITTA  
CW STAFF

MOUNTAIN VIEW, Calif. — Sun Microsystems, Inc. last week introduced a computer-aided software engineering environment (CASE) intended for use over a network in large development projects.

Called the Network Software Environment, it allows multiple developers on Sun 32-bit workstations to share tools and program files across the network and keep a library of source code changes.

The library, called the Version Control System, maintains a record of each version of a program and related objects,

such as design documents, project requirements, test data and drivers. The library keeps a history of all objects by saving changes to successive versions, which allows them to be recreated at any stage of their development history, Sun officials said.

In addition to supplying the underlying framework for a common development environment, Sun President Scott McNealy said, other vendors' CASE tools will be integrated into the network, although only two were mentioned with the announcement of Sun's product. They were Cadre Technologies, Inc.'s Teamwork family of front-end systems analysis

tools and Interleaf, Inc.'s Technical Publishing Software for document preparation.

The Network Software Environment allows concurrent access to development objects and prevents one developer's work from interfering with another, Sun officials claimed.

In addition, Sun officials said they will provide a single interface to all network functions for CASE tool integration. The single program interface will reportedly allow developers to tie their own tool sets into the network.

Network Software Environment is set to be available in first-quarter 1988 for \$2,500 per workstation, with networked installations eligible for a discount.

The development environment and

Sun workstations run under a merged Unix operating system that includes both AT&T's Unix System V and the University of California at Berkeley's Unix 4.2.

In addition, Sun officials announced a networked project management software package, Suntrac, to handle complex development projects.

It is available immediately for Sun-2, Sun-3 and Sun-4 workstations at a price of \$2,495 with volume discounts available.

CASE-related products make up about 40% of Sun's revenue. The Network Software Environment will help fuel hardware sales, McNealy said.

"It's an area that they've been in for a while," said Brian Boyle, industry analyst for Novon Research Corp. "It's just a next step."

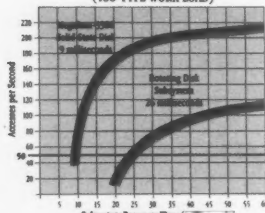
## The cost of faster response time just came down



### The MegaRam-3380... making solid-state disk storage practical for your IBM® mainframe.

Compared with the expensive alternative of buying upgraded or additional computers, the MegaRam-3380 provides a very economical method of reducing response time.

ACCESS RATE VS. RESPONSE TIME\*  
(TSO-TYPE WORK LOAD)



Lowers response times... economically. With the MegaRam-3380, on-line response times can be less than half of those of a conventional disk. What's more, this increased system performance can be achieved at a fraction of the cost of adding or upgrading processors, or installing numerous conventional disks.

So, when you need to add more users and applications to your system, without degrading response time, the MegaRam-3380 becomes one of your most economical alternatives.

Emulates the IBM 3880/3380 disk subsystem.

To your IBM 370, 303X, 43XX, 308X, 309X, and plug-compatible processors, the MegaRam-3380 looks to be the functional equivalent of the IBM 3880/3380 disk subsystem. No modifications to the system or application software are required.

No wasted data storage space.

Memory can be configured in 1 to 16 independently-sized logical volumes. Each volume can be sized to the amount of stored data — independently of other volumes. As small as one cylinder (713 Kbytes) or as large as the MegaRam-3380 capacity (2.048 Gbytes). The MegaRam-3380 doesn't waste space in your computer room either. A 256 Mbyte system fits within a cabinet requiring less than 5 sq. ft. of floor space!

Other features.

Quad-ports allow 4 channels to simultaneously access stored data. Three back-up and recovery systems assure integrity of stored data. Access time is 0.3 milliseconds; total system transfer rate is up to 12 Mbytes/sec.

Call for our new brochure; let us analyze your application in order to provide the most cost-effective solid-state disk system available.

\*For reference only. Other environments, configurations and processes may experience different levels of performance. IBM is a registered trademark of International Business Machines Corporation.



The MegaRam-3380... a high-performance, cost-effective, solid-state DASD subsystem. Can be configured with 32 Mbytes to 2.048 Gbytes of storage.

With the MegaRam, the only thing going up is your productivity.

## IMPERIAL

Imperial Technology, Inc.  
A Subsidiary of First Mississippi Corporation  
831 S. Douglas Street • El Segundo, CA 90245  
Telephone: (213) 536-0018  
Telex: 664469 • FAX: (213) 536-0124

## Arcnet boosters form trade group

BY JEAN S. BOZMAN  
CW STAFF

CHICAGO — More than 30 vendors that base their hardware and software on Arcnet met here last week, both to form a trade association to promote the token-bus networking architecture and to seek recognition for Arcnet as an international standard.

Datapoint Corp. Chief Executive Officer Robert J. Potter, whose firm invented the Arcnet protocol in 1976 and marketed it in 1977, urged the Arcnet Trade Association (ATA) members to try to make Arcnet an IEEE standard.

An earlier attempt to standardize Arcnet failed in the early 1980s, ATA members said, when Datapoint refused to facilitate the connection of non-Datapoint equipment to Arcnet.

"In the past, they have been reluctant to do that," said Harry Saal, president of Network General Corp. in Sunnyvale Calif. "But now we feel they've turned the corner on holding Arcnet as a proprietary protocol."

### Still cost-effective

Despite the decline of Datapoint's U.S. business and the emergence of other local-area network (LAN) technologies, 2.5M bit/sec. Arcnet is still viewed as a cost-effective LAN in comparison with others, such as Digital Equipment Corp.'s Ethernet standard.

There are more than 500,000 Arcnet nodes in the world, linked in 80,000 LANs, Potter said.

As many as half of these Arcnet nodes are accounted for by Novell, Inc.'s LAN installations. "My guess is 80% of the Arcnet nodes are not in Datapoint LANs and that Novell has the bulk of the non-Datapoint nodes," said John A. Murphy, who designed Arcnet while employed at Datapoint in 1976.

Five companies founded ATA, which was incorporated in August: NCR Corp. and Standard Microsystems Corp. in Hauppauge, N.Y., both of which make Arcnet interface chips; Datapoint; Gracon Services, Inc., an East Lansing, Mich., systems integrator; and Contemporary Control Systems Inc. in Downers Grove, Ill.

They, along with 30 others, plan to meet regularly and to demonstrate Arcnet technology at trade shows.

# TRY ORACLE'S \$1295 SQL DBMS FOR ONLY \$199 TODAY. OR ORDER VAPORWARE.

If you're looking forward to OS/2 and the next generation of PC database management systems to enable you to build larger, higher-quality PC applications, you'll be interested to know that:

- Ashton-Tate has announced its intention to replace its outdated database technology with a SQL DBMS under OS/2, and
- IBM has announced its intention to offer SQL for OS/2 in its Extended Edition.

All you have to do is wait. Wait for OS/2 and SQL. Wait until mid-1988...or later! Meantime you keep developing with soon-to-be obsolete dBASE™ technology.

But you don't have to wait for SQL on the PC.

Oracle has it now. And you don't have to wait for OS/2 to run programs larger than 640K. The ORACLE® DBMS allows you to run OS/2-size programs under today's MS-DOS™.

ORACLE is the number-one sell-



ing DBMS on both minicomputers and mainframes. If you try PC ORACLE, we think you'll make us number-one on PCs, too. That's why we're making you this special offer.

We've sold thousands of copies of PC ORACLE for \$1295. But now, for a limited time, we will send you the same, full-function version of ORACLE for only \$199.\*

That's right. Only \$199 for a PC SQL DBMS that is identical to the ORACLE that runs on minicomputers and mainframes. \$199 for the only PC DBMS that lets you

write larger-than-640K, OS/2-size programs and run them under today's MS-DOS.

ORACLE makes it easy to write large, high-quality applications using industry-standard SQL. Applications that run faster. Applications that are easier to use and have more capability. Multi-user, networked applications. Applications that can be devel-

oped on MS-DOS today, and then run unchanged on OS/2, minicomputers and mainframes.

So stop writing dead-end dBASE code today. And stop writing cramped, limited-to-less-than-640K applications. Call 1-800-ORACLE1 today. Or use the rightmost coupon. Or mail one of the other coupons. And wait.

**ORACLE®**  
COMPATIBILITY • PORTABILITY • CONNECTABILITY  
Call 1-800-ORACLE1 today.

## Dear Ashton-Tate,

20101 Matillion Avenue  
Torrance, CA 90502

Since you've announced your intention to go to SQL, I really don't feel like developing database applications in dBASE. I have every confidence your database will be full featured and complete. Send me what you've got when you get it.

## Dear IBM,

Old Orchard Road  
Armonk, NY 10504

Attached is a blank check. I keep reading that you've already announced that you're going to announce SQL for OS/2 and the Personal System/2.

When you do, fill in the check amount. Hope to hear from you sometime in the next couple years.

## Dear Oracle,

PC ORACLE • Oracle Corporation  
20 Davis Drive • Belmont, CA 94002

I want to run OS/2 ORACLE or MS-DOS today. I agree to use this license only for application development.

Send me (check only one)

- ☐ PC ORACLE \$199  
☐ ORACLE 2 • IBM Extended Memory \$299  
☐ ORACLE • IBM Extended Memory \$799

Pay by ☐ Check ☐ VISA ☐ M/C ☐ AMEX

Print Name \_\_\_\_\_ Date \_\_\_\_\_

Company \_\_\_\_\_ City \_\_\_\_\_

State \_\_\_\_\_ Zip \_\_\_\_\_

Card Order Number \_\_\_\_\_

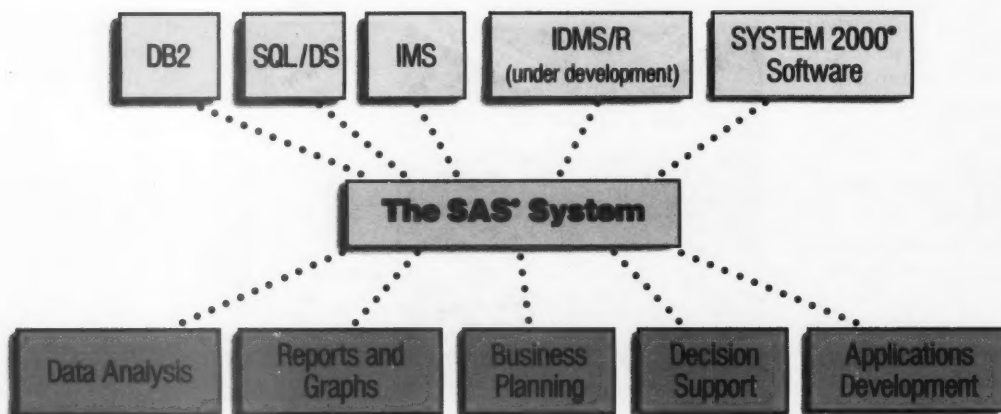
Card Expiration Date \_\_\_\_\_

Signature \_\_\_\_\_





# Get the Facts from Your DBMS.



**T**he most powerful applications software has joined forces with the most popular data base management systems. To turn raw data into meaningful facts. To analyze, estimate, optimize, simulate. To produce custom reports and color graphs. Whatever your information need, the SAS System delivers more from the data you store.

## **Don't Just Store Your Data. Explore Your Data.**

The SAS System's ready-to-use tools uncover the real meaning of all those names and numbers. Forecast sales and cash flow. Perform statistical analyses. Build financial and planning models. Create spreadsheets of unlimited size. Schedule projects for best use of time and resources. Produce stacks of personalized letters. Generate calendars, charts, and many other formatted reports. Spot relationships and graph trends with powerful presentation graphics.

Or develop your own applications with the SAS System's efficient fourth-generation language. Customize these applications any way you wish.

## **If You Know Data Bases. And Even if You Don't.**

Menu-driven interfaces link the SAS System with DB2, SQL/DS, or IMS data bases, and with SYSTEM 2000® Data Management Software. End users, even those

who know nothing about data bases, have immediate access to the data they need. It's as easy as filling in the blanks!

Extract data from your DBMS for use in SAS System applications. Load data from the SAS System directly into your DBMS.

Update values in a data base directly from a SAS System application. All without risk to data security. The SAS System lets you choose which users browse or update specific files.



## **Get the Facts Today. And Get 30 Days FREE.**

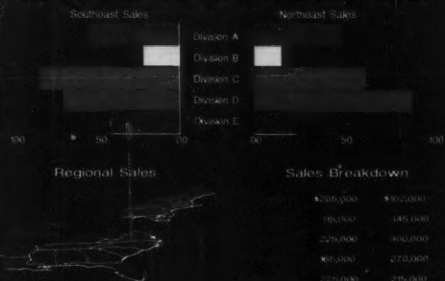
Bring the SAS System together with your data base. You'll receive high-quality software—plus training, documentation, and support—all from SAS Institute Inc. We'll even provide a free software trial to get acquainted. For details, call or write today.



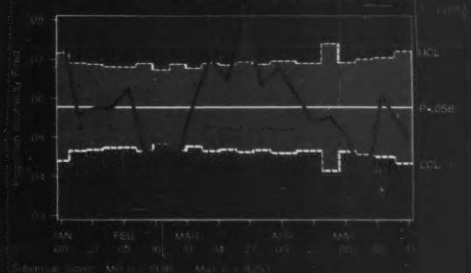
SAS Institute Inc.  
SAS Circle ☐ Box 8000  
Cary, NC 27512-8000  
Phone (919) 467-8000  
Fax (919) 469-3737

# Get the SAS<sup>®</sup> System.

## Ridge Medical Supplies Inc.



## Morgan Cosmetics Inc. P Chart for Perfume Bottle Capacity



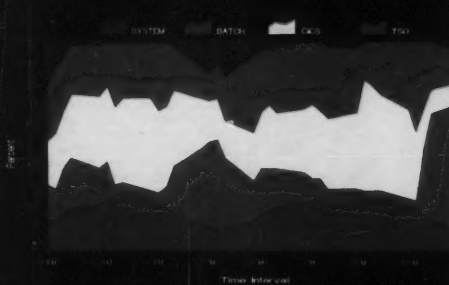
## EMS Software International Countries with Products Installed As of January 1, 1987



## Quarterly Sales



## CPU Utilization by Hour



## Schedule for Well No. 121-005



The SAS System runs on IBM Corp.'s 370/390/43xx and compatible mainframes, as well as minicomputers and personal computers.

SAS and SYSTEM 2000 are registered trademarks of SAS Institute Inc., Cary, NC, USA. DB2, SQL/DS, and RRS are products of IBM Corporation, Armonk, NY. EMBASE is a product of Elsevier Science Publishing Co., Amsterdam, The Netherlands.

Copyright © 1987 by SAS Institute Inc. Printed in the USA.

## Chip set may chop PS/2 board costs

Developer says product to lead to more feature-rich Micro Channel cards

BY JAMES A. MARTIN  
CW STAFF

SAN JOSE, Calif. — Chips and Technologies, Inc. is slated to unveil today an interface chip set for IBM's Micro Channel architecture that the vendor said will lead to the development of less expensive and more function-packed enhancement boards for the IBM Personal System/2 line.

By shrinking the Micro Channel interface into a single chip set, board makers will be able to pack more functionality onto their PS/2 enhancement cards and will not have to develop interfaces themselves. That could cut development and retail board costs by as much as 50%, according to Raj Jaswa, product manager for Chips and Technologies' systems logic division.

"So far, enhancement cards for the Micro Channel have offered only simple functions, like additional memory," Jaswa said.

"But with our chip set, you will see more true multifunction cards coming out with applications like facsimile and scanner emulation, among other things."

**Interested and concerned**  
Some 15 to 20 board makers have shown interest in the chip set, Jaswa said. He added that the first boards using the chip set should be available in the first quarter next year.

However, many board makers have already designed their own Micro Channel interfaces, and some said they are concerned about relying on a single outside source for a custom interface logic.

"If a vendor designs custom integrated circuits to add memory, they'll usually incorporate a Micro Channel bus interface into

those integrated circuits," said Martin Alpert, president of Cumulus Corp., a PS/2 enhancement board maker in Cleveland. "There's also the risk of going with a single source for custom logic," Alpert added. "But for those board companies that are not ready to build their own custom logic, this gives them a quick, easy way into the market."

Although Chips and Technologies' Microchips set will enable board makers to adapt their existing IBM Personal Computer cards to the Micro Channel architecture, that ability does not necessarily ensure that the board will take full advantage of the PS/2 features, Alpert said.

The Microchips interface chip set will reduce the space occupied on a Micro Channel board by as much as 20%, according to Jaswa.

## Terminal emulation costs headed down

BY JAMES A. MARTIN  
CW STAFF

SAN JOSE, Calif. — Quadram Corp. will announce today a low-cost IBM 3270 terminal emulation card for the IBM Personal System/2 Models 50, 60 and 80.

Using a single-chip 3270 protocol controller from Chips and Technologies, Inc., which claims it is the first such device, Quadram's board is expected to compete directly with the Digital Communications Associates, Inc. (DCA) Irma series of emulation boards on a price-point basis.

Quadram confirmed the announcement but would not disclose pricing details. However, a Chips and Technologies spokesman said his company's customers could offer Irma-compatible 3270 emulation boards for as little as \$400. DCA's Irma 2 board, in contrast, currently retails for \$800 to \$1,200.

Chips and Technologies' 3270 emulation product reduces the amount of necessary logic chips on a board from about 45 to eight, making half-size Irma cards more viable.

Using the 3270 chip and an IBM Micro Channel architecture interface microprocessor that Chips and Technologies is also scheduled to unveil today, Quadram will reportedly be able to offer Irma-compatible boards for the IBM Personal Computer and PS/2 series.

A spokesman for DCA said

the firm would not comment at length on the competitive boards until after Quadram's press conference. A Quadram spokesman said his company will give full details of the announcement today.

### Software the issue

"The important issue here is not hardware but software," said Bill Marks, a DCA spokesman. "We have made a lot of software changes to our product in the last few years, and it's the software that really drives the product."

Currently, DCA has 60% of the 3270 emulation market. Its most significant competitor, IBM, holds about 30%, and the other 10% is up for grabs, according to Mark Dunkel, a technology analyst with Robinson Humphrey Co. in Atlanta.

But Quadram's announcement should not have a major impact on DCA, analysts said, because of the company's strengths in marketing, support and software.

"Irma has really evolved in the past few years," Dunkel said. "It's not just a hardware product but a strong support- and software-oriented product."

Nonetheless, there is a "sizeable market potential" in selling Irma-compatible boards that "do 60% of what Irma does for 60% of the cost," Dunkel said.

DCA is a potential customer for the 3270 processor chip set as well, according to analysts and Chips and Technologies officials.

## Corporate Software develops upgrade service

BY ED SCANNELL  
CW STAFF

WESTWOOD, Mass. — Corporate Software, Inc. has introduced a service program that it claimed makes it easier and more cost-efficient for corporate information center managers to support large numbers of users.

Appropriately called the Service Plan, the program includes a data base of answers to specific product support questions, a bi-weekly customized report on the latest changes to a firm's core

products and a quarterly summary of procedures required to upgrade major vendors' software.

"The goal is to minimize the repetitive tasks that largely shouldn't be done by a skilled information center person, like what the latest version of something is," said Mort Rosenthal, Corporate Software's chief executive officer.

The basic service is for firms that spend at least \$3,000 per quarter and includes the *Corporate Software Guide*, a reference book evaluating more than

700 IBM Personal Computer and Apple Computer, Inc. Macintosh products.

Companies spending more than \$12,000 per quarter receive reports on upgrades to major products, a monthly technical publication listing bug-fix information and free copies of new products. Those spending \$60,000 get the Instant Upgrade program, which aids information managers who frequently upgrade large numbers of users, the firm said. The Service Plan is available immediately.

Attention all FX80, FX100, JX, RX, & MX owners:  
**You already own half of a great printer**

See us at  
Comdex  
booth B137



Now  
Only  
\$79.95

Now for \$79.95 you can own the rest. You see, today's new dot matrix printers offer a lot more.

Like an NLQ mode that makes their letters print almost as sharp as a daisy wheel. And mode switching at the touch of a button in over 160 styles. But now, a Dots-Perfect

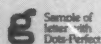
upgrade kit will make your printer work like the new models in minutes—at a fraction of their cost.

And FX, JX and MX models will print the IBM character set, too.

So, call now and use your Visa, MasterCard, or AmerEx. Don't replace your printer, upgrade it!

**1-800-368-7737**

(Anywhere in the United States or Canada)



Sample of  
letters with  
Dots-Perfect

**Dots-Perfect**

**Dresselhaus**



Sample of  
letters without  
Dots-Perfect

8560 Vineyard Ave., Ste. 405, Rancho Cucamonga, CA 91730

(714) 945-5600

An upgrade kit for EPSON FX, JX, RX, & MX printers

## Pitch. And Puff.

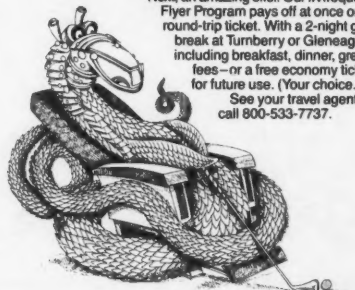
Both are pluses of our inviting new Business Class Plus. We give you a first-class sleeper seat with a monster-size 60" "pitch"—the biggest there is (even "Nessie" can relax).

Naturally, we offer you the spacious comfort of a 747 with full meal and bar service. Also free limo pick-up within 40 miles of Newark this end and Birmingham or Stansted (for London) the other. (75 miles for Prestwick in our native Scotland.) And note:

Highland Express is "the official airline" of Silicon Fen and Silicon Glen.

Next, an amazing offer. Our *Infrequent Flyer* Program pays off at once on a round-trip ticket. With a 2-night golf break at Turnberry or Gleneagles including breakfast, dinner, green fees—or a free economy ticket for future use. (Your choice.)

See your travel agent or call 800-533-7737.



**HIGHLAND EXPRESS**  
The Scottish Flag Carrier



## DEC net controls

CONTINUED FROM PAGE 1

to manage different components and aspects of a Decnet system. But some of these same companies complained about the absence of an overall management system that would bring all of those packages together.

MIEMSS' Guenon thought he had found exactly what he was looking for at Decworld: a system that displayed status and diagnostic information about different components or areas of a Decnet that linked the entire conference area.

"They were running a different Decnet management product in each of four windows on the screen, each with its own graphics display," Guenon said. His company wants to use such a system to centrally manage a new corporate site.

Unfortunately, DEC does not offer such a centralized network management system as a commercial product — yet.

"Every piece you saw at Decworld can be made available," Grenier said, "although not necessarily as a specific [commercial] product."

### Turning toward generic answer

The vendor's service organization can tailor such a system to an individual customer's needs, Grenier explained, adding that DEC intends to "solve these problems in a more generic way" by next year's Decworld as part of its new focus on enterprise networking.

Far from producing a Netview clone, however, DEC intends to continue distributing management functions across its networks and also provide managers with the option of consolidating certain data elements in a central place for viewing, storage and later analysis, Grenier indicated. "It doesn't matter where the data originally resides, as long as I can get it and it's current," he said.

Interestingly, Decnet and Netview do not seem to compete for the title of corporatewide network management system, because companies with both systems tend to keep them separate.

"IBM equipment is handled by a completely different side of the house," said MIEMSS' Guenon. "We only handshake with them over DEC's SNA gateway."

"We really have three networks," said Richard Crane, director of systems operation and telecommunications at Gillette Co., where DEC computers and IBM Personal Computers are linked on an Ethernet running Decnet.

IBM computers on an IBM Systems Network Architecture (SNA) network can talk to DEC computers via a gateway from Interlink Technologies, Inc. And a variety of asynchronous and synchronous devices are linked over an AT&T Integrated Systems Network (ISN).

Gillette began using IBM's network management products "long before they became components of Netview," Crane said.

The Boston-based company is now looking at DEC management tools for the Decnet installation and wistfully hopes that AT&T will "improve ISN's diagnostic capabilities," he added.

"It is not a major concern for us to bring all of the networks under one management system," Crane said. "I'd much rather use a vendor's own tools to manage its network. You lose something with a generic system."

Another direction in which DEC is

moving — albeit too slowly for some users — is toward extending its management functions to other vendors' products.

This cannot happen too fast to suit Pitney Bowes, Inc. The Stamford, Conn.-based firm's corporate engineering and technology division is looking for a way to manage a heterogeneous network of DEC VAXs and Microvaxes, assorted personal computers, Apollo Computer, Inc. and Sun Microsystems, Inc. workstations and AT&T 3B computers.

"I want a package that will cut across vendors; that will allow me to manage the whole network as if it were a single computer," said George Billings, a manager of the company's network and computer operations.

Billings has been evaluating DEC's LAN Traffic Monitor and NMCC/VAX Ethernet, both of which can keep track of traffic and utilization on a mixed network of DEC and non-DEC systems.

Ethernet detects when nodes are on or off the network. The Monitor can keep track of nodes' utilization of the network and can compare frequency of packets us-

**"I**T IS NOT a major concern for us to bring all of the networks under one management system. I'd much rather use a vendor's own tools to manage its network. You lose something with a generic system."

RICHARD CRANE  
GILLETTE CO.

ing Decnet, Transmission Control Protocol/Internet Protocol and Sun's Network File System protocols. This is a key function for Pitney Bowes, which uses all three.

While he said he feels that DEC may be further along than any other vendor in extending its management tools to other companies' products, Billings emphasized that there is still room for improvement.

For example, Pitney Bowes would like to use DEC's Remote System Manager to back up remote files and perform software updates for remote non-DEC systems. Currently, the software only works with DEC's VMS and Ultrix systems.

### Links through OSI expected

DEC plans to link other vendors into its network management system through the Open Systems Interconnect (OSI) protocols as soon as those protocols are stable enough, Grenier said.

The computer company reportedly is working with third-party vendors to provide OSI-based links to non-DEC systems and is expected to announce these offerings at next year's Enterprise Networking Event '88 International.

Pitney Bowes' Billings was less than reassured by DEC's promises to provide true multivendor network management through OSI protocols that he described as "still completely up in the air."

Meanwhile, Billings is still looking at other vendors' networking and management tools. "One main reason we have a multivendor network is not to be dependent on any one company," he said.

## NOW THERE'S A NEW NAME ON THE BLOCK FROM THE LEADER IN DATA TRANSFER SOFTWARE...



The Systems Center put the foundation in place with Network DataMover (NDM) for MVS. It became the data transfer standard among leading corporations with multiple MVS mainframes. To top it off, now there's Network DataMover for VM.

The two products are built on a common architecture. Which gives you the ability to transfer VM files, such as CMS, into one of many MVS file formats. And vice versa. NDM also gives you complete control over MVS and VM data transfer operations through automation, security and detailed audit trails.

So whether your network includes MVS, VM or both, NDM offers a single solution. But these are just two of the NDM names on the block. There are more just around the corner...

**1-800-292-0104**

In Texas 214-550-0318



The Network  
DataMover Company

The Systems Center, Inc., 2477 Gateway Drive, Suite 101, Irving, TX 75063

IBM is a registered trademark of International Business Machine Corp.

# Informix, Innovative to merge

Firms set February date for \$82M union targeting large users

BY ALAN J. RYAN  
CW STAFF

MENLO PARK, Calif. — Informix Corp. and Innovative Software, Inc. announced late last week that they intend to merge their companies, creating a single firm that will heavily target corporate America and government markets.

The companies executed a letter of intent on the merger, which is valued at approximately \$82 million, based on the closing Informix stock prices last Wednesday. The deal is expected to be completed by February.

According to Wynne Jennings, vice-president of finance at Innovative, the merger will help increase the presence of both companies in the government market. "The government is a big user of Unix and Xenix

and those kinds of systems. Together, our opportunities in the government market will be greatly enhanced," he said.

One area in which the merged companies will concentrate is office automation, Jennings said. "We're planning to come up with an office automation solution using an SQL-driven engine," he added.

Jennings said the two firms will work on "a total solution, providing integration over the user interface and integration over the data. We'll be able to provide it all, regardless of what operating system you're using, whether it is Unix, VMS or DOS."

Informix, through its wholly owned subsidiary Informix Software, Inc., is strong in SQL applications, development tools and data base management sys-

tems for the Unix, DOS, IBM MVS and Digital Equipment Corp. VMS marketplace. The company employs approximately 350 people.

Innovative designs, develops, markets and supports a product line of applications such as spreadsheets and word processing, and its power lies primarily in the Unix marketplace and the high-end DOS marketplace.

## Like bacon and eggs

"The complementary nature of the stocks is extraordinary," said David Thomas, an analyst with Hambrecht & Quist, Inc. "There is little or no redundancy in the products of the two companies."

According to Dick Murphy, vice-president of corporate development at Informix, the discussions on merging the compa-

nies came about while the two firms were negotiating the joint marketing of a product.

Thomas noted that both companies have strong direct sales, and each has strong OEM relationships with various vendors. "They're both growing at practically the same rate," he added. "The synergies are very bullish."

**I WAS surprised to see the [Informix and Innovative Software] merger price that low."**

CHARLOTTE WALKER  
L. F. ROTHSCILD & CO.

Charlotte Walker, an analyst with L. F. Rothschild & Co., agreed. "The assets that each of them bring to the table are very powerful. The merger makes an awful lot of sense," she said, but

added that Informix fared quite well financially in the deal. "I was surprised to see the merger price that low," she said.

According to the terms outlined in the letter of intent, Roger J. Sippl, founder of Informix, will be chief executive officer and chairman of the board of the combined companies.

Michael J. Brown and Mark R. Callegari, cofounders of Innovative, will be president and chief operating officer and vice-president of advanced product research, respectively. They will likely remain at the Innovative facility in Lenexa, Kan., after the merger, and Sippl will most likely remain here, Murphy explained.

According to the terms of the letter, Innovative shareholders would receive three-fourths of a share of Informix common stock for each share of Innovative common stock. Informix shares would be reserved for issuance upon the exercise of Innovative's outstanding debentures on the same basis.

# Wordperfect DBMS spices up bland PC Expo

BY JEAN S. BOZMAN  
CW STAFF

CHICAGO — Wordperfect Corp. demonstrated its unannounced Dataperfect data base management system for IBM Personal Computers and compatibles at the PC Expo show here last week. Dataperfect is scheduled to be announced officially at next month's Comdex/Fall '87 show in Las Vegas.

Described as a relational DBMS, Dataperfect is a companion product to Wordperfect that allows users to merge DBMS records with Wordperfect documents.

The announcement is also a competitive move against Ashton-Tate, the Torrance, Calif.,

maker of Dbase III, and Microrim, Inc., the Bellevue, Wash., manufacturer of R:Base. Until now, many Wordperfect users had relied on the product's Convert function to gain access to those DBMSs.

## Saving steps

"No word processing package that we knew of was completely compatible with the widely used DBMS packages for personal computers, R:Base and Ashton-Tate's Dbase," said Kent Fuge, special projects coordinator for Wordperfect's marketing group. "Usually," he added, "you have to export the data and go through several processes to get it compatible with Wordperfect or with other packages."

The design of Dataperfect, however, will allow users to merge a form letter written in Wordperfect with a mailing list of customers' names stored in Dataperfect fields, Fuge said.

Other suggested applications for the product include inventory, payroll and time-and-materials accounting.

Individual fields in Dataperfect may run to 32,000 characters, and as many as 16 million records may be stored in the DBMS. A test version of Dataperfect at Wordperfect's Orem, Utah, headquarters held 297,000 customer records in 35M bytes, according to Fuge.

The package was written over a period of two years by Lou Bastian, brother of Wordperfect

founder Brian Bastian. A single-user version of Dataperfect will be priced at \$495; a multiuser version for networked environments is also planned. The networked product, which has not been priced, will run on 10 local-area network packages, including Novell, Inc.'s Netware and 3Com Corp.'s Ethernet and 3+ software.

## No thanks, we'll pass

Few firms chose to use PC Expo for new product announcements, with most participants electing to wait for Comdex. PC Expo show managers estimated that 15,000 people attended the exhibition at McCormick Place during the three days it lasted.

However, attendance at floor

exhibits was sparse, and many visitors stopped in only for short periods.

Personal computers are so widely used that they are finally finding their way into the executive suite, according to PC Expo keynote speaker Bernard Sergesketter, vice-president of AT&T's Business Markets Group, Central Region.

Sergesketter said he has gotten so accustomed to his AT&T 6300 and 7300 IBM-compatible computers that he receives electronic mail in his home after-hours and reviews mainframe reports on his PC at work.

"I can go away on a business trip and page through all that has happened in about 20 minutes," he said. "Now, I can get up to date quickly, and I don't have a stack of papers facing me each morning."

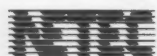
## Uptime

### Provide 24 Hour CICS Service

IBM gave dynamic allocation to CICS... but you need Netec's CAFC to make non-stop CICS a reality. CAFC allows a single command to OPEN or CLOSE 5 or 50 files. CAFC establishes two way communication between your CICS regions and your batch jobs. Your batch jobs will always have the files they need for processing without operator intervention.

### Browse and Archive CICS 1.7 Dumps

The CICS Dump Display Facility gives your support staff instant on-line and hardcopy access to CICS transaction and system dumps. You may view and print any dump without disturbing CICS. CDDF archives your dumps for after-the-fact analysis. You may route dumps to remote locations.



Netec International, Inc.  
P.O. Box 18538 • Dallas, Texas 75218  
Telex 314419 TELECOM UD (214) 324-2848

## IMPROVE

# MVS/DASD

PCF™ dynamically adjusts your disk resources to match your MVS workloads. PCF™, Pool Configuration Facility...

- Saves up to 25% of your present space
- Maximizes batch throughput
- Optimizes on-line performance
- Reduces space failures
- Makes no modification to MVS
- Eliminates VATLST maintenance

For a free 30-day trial call (312) 525-6400

—ChicagoSoft™

738 N. LaSalle Street, Chicago, Illinois 60610

See us  
at CMG '87  
Booth 532

# NEC Unix shift solidifies

*Firm to add four departmental systems at Unix Expo*

BY JAMES CONNOLLY  
CW STAFF

BOXBORO, Mass. — NEC Information Systems, Inc. is scheduled next week to complete its year-long move into the Unix-based departmental systems market with the introduction of four systems supporting up to 32 users.

The products, scheduled to be introduced at the Unix Expo show in New York and outlined in NEC press briefings last week, include four models of the Astra XL family. Those systems are based on 16.7-MHz Motorola, Inc. 68020 microprocessors and NEC's ASTR-IX operating system, which is based on AT&T Unix System V with University of California at Berkeley BSD 4.2 extensions.

Part of NEC's strategy is to price the systems 10% to 15% below competing Unix systems and to keep the entry-level price at a point comparable to personal computers, according to Tim Corkery, director of business systems marketing for NEC. Corkery said prices will be finalized this week but added that those prices are expected to range from around \$8,500 for a base MicroXL configuration to about \$22,000 for a basic Astra XL/32 system.

## Small packages

The high-end XL/32 carries the same name as NEC's existing Unix-based system, which was introduced last year essentially as a prototype for software developers.

Corkery said the new XL/32 is source code-compatible with the original system while being half the size and supporting

more disk storage than the prototype.

The four Astra XL models are the eight-user MicroXL and XL/8, the 16-user XL/16 and the 32-user XL/32. The entry-level MicroXL is a desk-side system that can be expanded to support 16 users but cannot be upgraded to the other models. The XL/8 can be upgraded to a 16- or 32-user system, Corkery said.

The models support from 2M to 16M bytes of memory and up to 2.5G bytes of disk storage. NEC is positioning them as departmental systems and small-business systems for general accounting and vertical markets, including telephony, hospitality, health care, law, manufacturing, construction, government and education.

Corkery said NEC is counting on those third-party software vendors to make Unix easier for commercial customers to use. "We probably are looking more at the evolving Unix market rather than the one that is there now," said Corkery about targeting the commercial market instead of the technical-computing market.

Corkery said the Astra XL line was designed to compete with Unix-based systems sold by vendors such as Altos Computer Systems, Inc., AT&T, NCR Corp. and Convergent Technologies, Inc.

He said the new systems are unlikely to compete with the existing Astra 300 line of small systems, which run NEC's ITOS operating system. Corkery also said the ITOS-based product line will be expanded next month with the introduction of an Astra 400 at Comdex/Fall. He said the Astra XL systems will be available in December.

# Kodak dishes up nonstick diskettes

BY ALAN ALPER  
CW STAFF

NEW YORK — Teflon, the substance that made possible nonstick pots, pans and politicians, is now being used to protect floppy diskettes. The manufacturer, Eastman Kodak Co.'s Verbatim Corp. subsidiary, claims the media are almost impervious to accidental mishandling that could cause data loss.

Verbatim last week introduced a new line of 5¼-in. floppy diskettes that are coated with Teflon in order to resist substances such as coffee, smudges and fingerprints.

Any substance remaining on the recording surface after being cleaned will be absorbed by the floppy's jacket lining when the diskette begins to spin, Verbatim officials said.

The firm turned to teflon coating, developed by Du Pont Co., in response to focus group studies that found that accidental damage to diskettes caused by mishandling is a chief concern of computer users, both in the office and at home. Accidental loss of data due to mishandling is still a problem, Verbatim officials contended, since many users still do not back up data.

Analysts were divided on the virtues of teflon-coated floppies. Some claimed accidental mishandling is not as big a problem as defectively manufactured diskettes

that are not tested properly. Others contended that protecting users from accidents is a useful function.

"To me, anything that makes floppies more reliable is a good thing," noted David Vallenti, an analyst at International Data Corp. in Framingham, Mass.

Verbatim's teflon-coated diskettes are being marketed under the name Datalife Plus and will be available starting next week through the firm's resellers. A package of 10 diskettes is expected to retail for between \$15.99 and \$16.99 — approximately 15% more than Verbatim's existing product line.

## You get what you pay for?

"We think that users will be willing to pay a little more for a product that is demonstrably better," said Mark Welland, Verbatim's vice-president for marketing and sales for North America.

Datalife Plus will initially come preformatted in a 48 track/in. format for the 360K-bit diskettes used by the IBM Personal Computer and compatibles. The company will release preformatted diskettes for IBM PC ATs and compatibles in the second quarter of next year, Welland said.

The teflon-coating process will not be used with 3½-in. floppies, because those diskettes come with a hard jacket and shutter that protect them from being damaged by foreign substances.

# NETWORK DATAMOVER MEETS YOUR DATA TRANSFER REQUIREMENTS NO MATTER HOW THEY STACK UP.



Staying on top of your network is a big challenge. How do you transfer different file types between MVS and VSE? Or VM and PC? How do you coordinate production activities among data centers? What if they're using different security systems? Or running at different release levels?

Network DataMover (NDM) meets all these challenges while making the technology transparent to users. There are standard data transfer and production management tools at all NDM nodes. And all nodes operate as peers.

So give us a call if you need to get your data transfer operations off the ground. NDM offers a single solution from top to bottom. No matter how your network stacks up.

**1-800-292-0104**

In Texas 214-550-0318



The Network  
DataMover Company

The Systems Center, Inc., 2477 Gateway Drive, Suite 104, Irving, TX 75063

IBM is a registered trademark of International Business Machine Corp.



# Gates paints picture for MIS execs

BY DAVID A. LUDLUM  
CW STAFF

SEATTLE — Information systems executives preoccupied with a jumble of aging, dissimilar systems were handed a graphical view of the future by Microsoft Corp. Chairman Bill Gates at the 19th annual conference of the Society for Information Management last week.

Gates predicted that within three years, 80% of all personal computers will have a graphical user interface like the one Microsoft is developing with its Windows products and the Presentation Manager component of the forthcoming IBM OS/2 operating system.

Gates recommended that information systems managers "move people to a standard user interface as soon as you can," thus saving support costs, and evaluate Microsoft's MS OS/2 for various applications. He noted that even people at his company are not sure when applica-

tions running on MS OS/2 will be available.

Gates also said microcomputers running MS OS/2 will be as sophisticated as minicomputers and mainframes now in use. He said about half the independent developers working on MS OS/2 applications had previously developed programs for those larger computers.

## Out with the old . . .

Microsoft is exploring compact disk (CD) technology with a large research team, Gates noted. "You're going to see lots of things that had been in paper form in electronic form," he said, citing as an example the use of CDs to replace cumbersome parts manuals.

Most of the discussion by other conference speakers and the 500 managers attending, however, revolved around controlling information resources and making systems already in use more effective.

Concerns at the gathering included

mutual understanding among information systems executives and general managers, justifying expenditures on systems and linking isolated systems. Robert L. Dryden, president of Boeing Computer Services, Inc. and another keynote speaker, said Boeing has improved productivity with systems since the 1960s but has created "islands of automation."

Dryden said the critical technological issues facing information systems executives are a lack of communication standards, inadequate development tools and a need for common data base formats.

He advised information systems managers to regard information, such as engineering specifications, as a strategic resource and part of a "design/build process" that results in a product.

Managers attending the conference said they share Dryden's concern with islands of automation. George F. Clancy Jr., director of information systems at Citizens Gas and Coke Utility of Indianapolis,

said he is trying to pull together pools of information into a company resource available to everyone who needs it.

## Things to work on

"Having data and making it available to everyone across applications and across organizations — that's what we haven't done very well," Clancy said.

Many at the conference cited business issues in describing their greatest concern. Norman A. Matussek, MIS manager at B. F. Goodrich's Chemical Group in Cleveland, said he seeks answers to practical questions raised in trying to implement visions of strategic information systems, such as whether inventory information and other internal data should be shared with customers.

Justifying systems is the biggest issue facing David A. Scheibe, chief of the office of management in the Information Systems Division of the Washington State Department of Transportation. "How do you measure if you're automating the right thing — getting the right return? Return-on-investment by itself doesn't do it," Scheibe said.

# Industry group supports Air Force Unix standard, shells DEC protest

BY MITCH BETTS  
CW STAFF

WASHINGTON, D.C. — A federal appeals board is expected to rule this week on Digital Equipment Corp.'s protest of a U.S. Air Force computer procurement that requires the Unix operating system. The case has turned into a major industry battle over proprietary and open system architectures.

In the latest development, the Computer & Communications Industry Association (CCIA) took the unusual step of filing a brief that supports the Air Force position. The brief also blasts the DEC

protest as anticompetitive.

DEC, joined by Wang Laboratories, Inc., argued in its Aug. 12 complaint that the Air Force specification improperly favors AT&T as a bidder because it requires operating systems that conform to AT&T's Unix System V Interface Definition, as measured by AT&T's verification suite [CW, Aug. 24]. DEC and its supporters said the government should specify functional requirements, not operating systems.

The contract, worth an estimated \$3.5 billion, is for 20,000 multiuser computer systems and must be awarded through full and open competition.

The CCIA, a trade association of 54 companies, said the Air Force specification will promote competition and software portability because Unix System V is an open operating system that is freely licensed to numerous hardware and software vendors on reasonable terms. Proprietary operating systems such as IBM's MVS/XA and DEC's VMS are not freely licensed, it said.

The Air Force only required vendors to offer operating systems that conform to the System V Interface Definition, which allows a wide variety of AT&T-licensed systems or totally independent systems to be offered, the CCIA said.

"DEC's protest is defective because it attempts to blur the critical distinction between closed, proprietary operating systems and an open, nonproprietary definition of an interface, which leads to open operating systems," the CCIA brief said.

# IBMers take Nobel Prize

IBM researchers last week were awarded the company's second consecutive Nobel Prize for physics as two IBM scientists were honored for their work on superconductors.

The Nobel committee said that J. Georg Bednorz and K. Alex Mueller of IBM's Zurich laboratory will receive the award for their 1986 discovery that a class of oxides becomes superconducting at temperatures significantly higher than the previous record, established 13 years earlier.

Last year, IBM scientists Gerd Binnig and Heinrich Rohrer received the Nobel Prize for physics in connection with their invention of a scanning tunneling microscope that allows surfaces of materials to be seen at the atomic level.

IBM officials credited the work of Bednorz and Mueller with leading to a string of developments by IBM researchers and scientists in other organizations.

The work of Bednorz and Mueller dates back to 1983, when they began three years of research that led them to report in 1986 that oxides have the potential to be superconductors at 35 degrees Kelvin (K) — significantly warmer than the previous record of 23 K at which a compound of niobium and germanium showed superconducting traits in 1973.

Researchers within IBM and other organizations have since found compositions, based on an yttrium barium copper oxide, that become superconducting above 90 K, which is well above the 77 K boiling point of liquid nitrogen.

IBM officials said other breakthroughs stemming from Bednorz and Mueller's work include IBM's development of a high-temperature, thin-film magnetic detector known as a superconducting quantum interference device, an industrial spraying technique for coating shapes with superconducting material and the discovery that superconducting materials can carry enough electricity to be useful for most foreseeable applications.



## Slay the payroll tax dragon with BSI-TAX from Business Software, Inc.

Over the past eight years BSI-TAX has defeated the payroll tax dragon for more than 950 U.S. and Canadian organizations — governmental agencies and businesses of all types.

In fact, 7 of the 10 largest U.S. corporations rely on BSI-TAX. They all know first-hand that our software contains features not available elsewhere. They depend on receiving the most timely and accurate tax updates in the industry. And they appreciate the choice our support service offers — a choice that allows either the payroll department or DP to receive and implement tax changes.

Likewise, you can benefit from the unmatched BSI-TAX system, the support and our staff of experts who can quickly answer any question. So let the company that specializes in payroll taxing arm you with the weapon to slay your dragon.

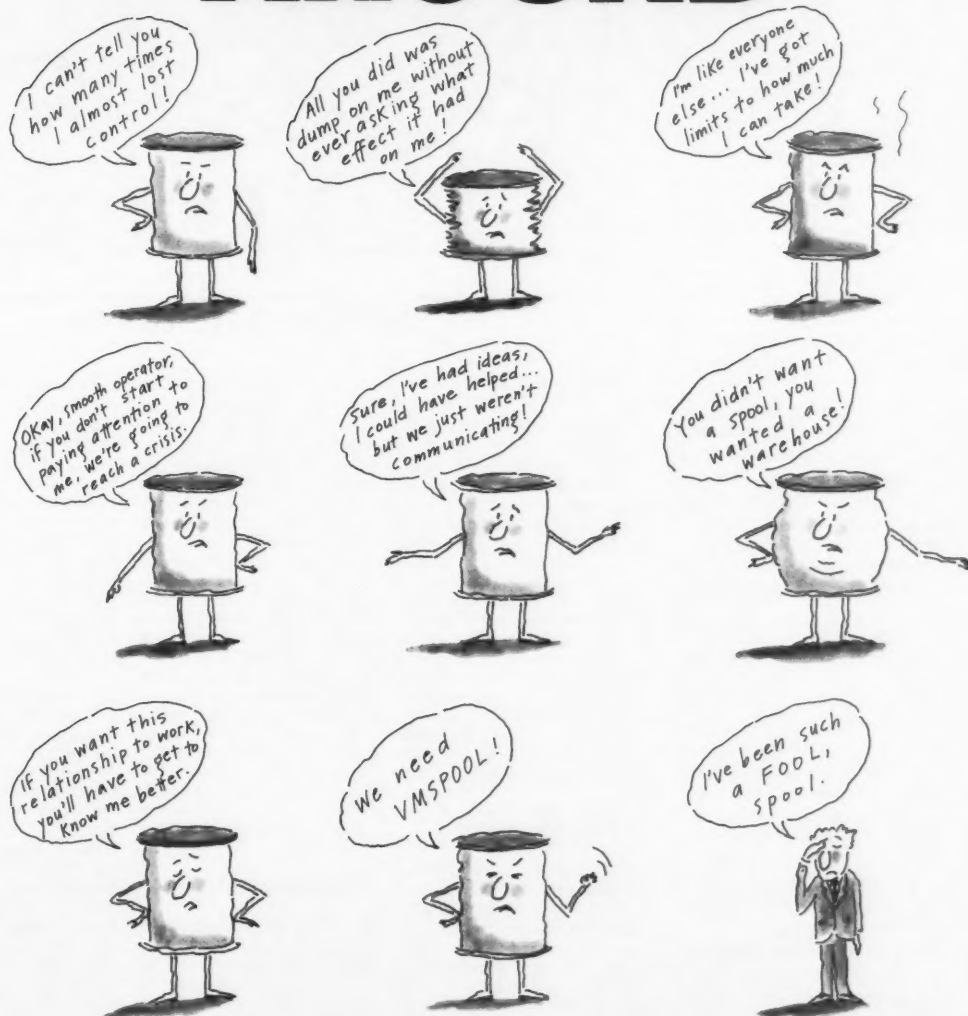
Available in Cobol or RPG III

**BSI**  
Business Software, Inc.

Call or write for free information packet.

3957 Pleasantdale Rd./Suite 107  
Atlanta, GA 30340  
(404) 449-3200

# "I'M TIRED OF SPOOLING AROUND"



## GET THE HELP YOU NEED WITH VMSPPOOL

**P**ity the poor spool system. Overworked, misused, and ignored. This can be dangerous. A misunderstood spool system is a crisis just waiting to happen. But you can change all that with VMSPPOOL from VM Software, Inc.

VMSPPOOL monitors spool usage and gives you the tools you need to manage it efficiently. You choose the capacity threshold that makes sense for your organization. VMSPPOOL not only warns you when you've reached that point, but gives you advance warning in the form of trend information, so you know just how much time you have to clear spool space.

The "state-of-the-spooling-system" display shows you the biggest users and the biggest files, so you know right where the problem is. And you can get this information anytime

you want or need it, not just when VMSPPOOL has identified a problem.

VMSPPOOL gives you complete information on spool usage by owner, date, type of spool file, queue, filename, etc. and it gives you comprehensive selection, sorting, and summarization capabilities. VMSPPOOL also creates complete CP accounting records, performs automatic file purges by criteria you set, and lets you move selected files to tape.

Like all VM Software products, VMSPPOOL puts you in control of critical aspects of your system. For more information, please call

**800-562-7100** (In Virginia or outside the Continental U.S. 703-264-8000).  
Or write VM Software, Inc., 1800 Alexander Bell Drive, Reston, VA 22091



**SPECIAL INTRODUCTORY DISCOUNTS AVAILABLE BEFORE NOVEMBER 30, 1987.**

Copyright © 1987 VM Software, Inc.

1-CWX-871019

## EDITORIAL

## Seizing the reins

IT COULDN'T HAVE been put more poignantly, or with more flair, than the way David Chevalier made his point.

Standing in front of seminar audiences both at last month's Info '87 and last week's PC Expo, Chevalier, director of national account marketing for PC's Limited, asked his audience for a show of hands indicating those whose shops have a three- or five-year large system plan. Almost all nodded, almost all smiled, almost all raised a hand.

Then he asked the payoff question (he'd been setting them up): "How many of you have an end-user computing or micro implementation plan?" At Info, a lot of foot shuffling, but no hands; at PC Expo, one tentative wavering hand out of an audience of more than 100 — mostly MIS managers. Chevalier asked, Do you know that MIS will spend in excess of 50% more on acquiring micros than on mainframes this year? A few more nods now that he'd really gotten their attention.

All right, so nobody wants to inherit yet another planning responsibility, especially something as potentially complex and far-reaching as a personal computer implementation blueprint. But the fact is this: The PC workstation will become the premier tool with which MIS executes its most vital and demanding role in the coming years, and that is the dispersal of information and information technology throughout the organization.

It is clear beyond the shadow of any reasonable doubt that the direction or control of PC planning and acquisition in Fortune 1,000 companies has been passed to MIS. As Glenn Miller, a veteran MIS professional and current director of strategic product planning at Businessland, said at PC Expo, the role of MIS in the PC acquisition process has "grown to primary control... due to the increasing risk-management issues."

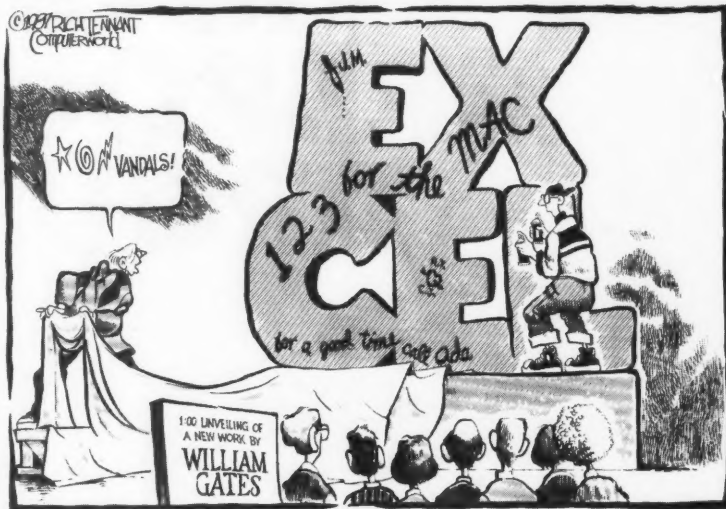
Further proof of the primacy of MIS in this process will be detailed in *Computerworld* next week, when we unveil the results of a far-reaching and comprehensive survey of PC acquisition patterns in Fortune 1,000-type firms.

So whether they were wanted or not, the PC horses are hitched to the MIS wagon. Now what is needed is a firm grip on the reins, and that means some sort of implementation plan.

In an increasing number of shops, MIS is getting closely, if not intimately, involved with detailed specification and quality control for significant PC buys — meaning either large volume or high-complexity buys. In Miller's words, this is best accomplished by balancing end-user requests with corporate directives from above.

Further, some key elements of large system planning processes can be incorporated into end-user plans.

Whatever planning tack is taken, a course should be set immediately. In about three years, there will be a one-to-one relationship between the number of white-collar workers in the U.S. and the number of PCs installed. There should be a sense of urgency here.



## LETTERS TO THE EDITOR

## More for less

The article "Price cuts should up modem use" [CW, Aug. 24] on 9.6K bit/sec. dial-up modem prices did not point out that a number of significant products — including U.S. Robotics, Inc.'s Courier HST modem — are available for substantially less than the V.32 modems listed. V.32 modems appear to be getting more attention from the news media than from modem buyers, who are discovering they can get everything they need in a high-speed modem for less — much less.

Mark Smith  
Communications Director  
U.S. Robotics, Inc.  
Skokie, Ill.

## Site licensing

The article "Never Mind! Businesses cool off on site license issue" [CW, Sept. 21] is not our view of the world.

United Software Security, Inc. has been site licensing its backup and security personal computer software products for three years and has more than 100 licenses to its credit as a result.

While site licensing should not be interpreted as an easy or short-term effort, it is very much alive among the more progressive and better organized corporations with substantial commitments to PCs.

We have found that companies willing and able to establish product standards have a consistent requirement for top-quality products.

In addition, the supplier commitment to product maintenance is an issue that is often researched. We are expected to be able to demonstrate our commit-

ment to changing operating system and equipment environments as well as the addition of new features to meet evolving needs. As companies become more sophisticated in their thinking about PC software, this has become an increasingly substantial matter.

Site licensing involves a commitment from both the supplier and the buyer. It is not a matter that is entered into lightly by the buyer and this method of doing business should not be considered lightly by suppliers. Sales cycles range from three months to a year and a half, and, as a result, require a level of tenacity that is more often seen in the mainframe software arena.

Stephen M. Hicks  
President  
United Software Security, Inc.  
Vienna, Va.

## Pros and cons

Regarding the Spotlight section on the state of the data base management system world [CW, Aug. 10], I want to comment on James Bradley's comparison of Cullinet Software, Inc.'s IDMS/R and IBM's DB2.

Since the data base engine used by both systems is essentially a network structure, the main differences between the two would seem to be the degree of access to the network pointers allowed for the application programmer.

The IDMS/R pointers are accessible. The advantage is that selected access paths can be optimized to provide performance beyond that currently possible with DB2. The disadvantages are that data base tuning is almost an art form, requiring the work of highly paid specialists, and the physical data base will

likely have to be restructured to optimize changes to the logical design.

DB2, on the other hand, has a more intelligent front end to the data base engine. The advantage of this is that the DBMS can make some of the tuning decisions that must be made by the data base designers under IDMS/R. The disadvantage is that those decisions will often not produce the performance that can be expected from a manually tuned IDMS/R system.

Cullinet is developing an SQL-based intelligent relational front end on the IDMS/R data base engine; IBM is working to increase DB2's performance. Assuming that both are successful, future differences between the two systems will be more in dictionary implementation, available development environments and fourth-generation language front ends, personal computer-to-mainframe linkages and vendor support than in which data base is the fastest or most flexible.

IDMS/R, however, has the added problem or opportunity of having to be backward-compatible. DB2 is a clean break from IBM's IMS, with a few bridges built between the systems but no real effort made to integrate.

The problem for Cullinet is obvious, but the opportunity also becomes clear considering that the underlying structure of DB2 is a network. If IDMS/R's net-

Continued on page 22

Computerworld welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor, Computerworld, P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701.



# Treat consultants as valued partners

*Nurturing good consultant relations programs will prove to be a wise investment in the future*

EFREM MALLACH



Fact: No firm has the best product for all applications and all users under all circumstances.

Fact: Every firm has the best product for some application and some user under some circumstances.

Fact: Any firm can, within limits, make a product seem well suited for a specific application for a specific user under specific circumstances.

Fact: Sales agents have powerful incentives to do this.

Fact: Prospective computer buyers know the first four facts.

What does a bewildered buyer do? Generally, call in a consultant.

According to Schueler Communications, consultants helped select \$57 billion worth of systems and software in 1986.

As soon as a consultant arrives, a vendor's chances depend partly on the merits of the prod-

**F**OR THE consultant to survive, clients must stay satisfied with recommendations until they forget who made them.

uct for the application and partly on how the consultant feels about the vendor.

Why? Because selection advisers depend on client references (which includes obtaining follow-on work with the same client). For the consultant to survive, clients must stay satisfied with recommendations until they forget who made them.

So, consultants want to be sure about the following:

- The product. The client must not learn three months later that a different product would have done a better job. (This fact limits the tendency of some advisers to recommend "safe" vendors.)
- The supplier. Maintenance and training must be evaluated, along with other aspects of an

ongoing business relationship.

- Resource availability. That the resources exist is not sufficient. Will they be available when needed? And does the consultant know how to access them?

Only the first of these assessments has a prayer of being objective. The others are evaluated as they are perceived. A vendor may be willing to demonstrate a product, but if the consultant does not know how to arrange a demonstration, it will appear that the vendor is not willing.

## A curable problem

For vendors to obtain consultant recommendations, they must get their message across to the consultants. Most vendors do a pitiful job in this department, but this problem is curable. For a start, vendors must recognize that positive consultant relations are based on two cornerstones:

- A commitment to follow-through. It takes at least six or eight exposures in the course of a year or so to make an impression. Start-and-stop efforts convey unreliability. There is nothing worse than a 3-year-old Consultants' Guide on a shelf as a reminder that a firm cannot finish what it starts.

- A partnership attitude with consultants. Some vendors treat consultants as adversaries, others as partners. Vendors who do not feel this partnership — and it cannot be faked successfully for long — should forget consultant relations programs until their attitude changes.

Once these attitudes are in place, a firm can begin to work with consultants effectively. The next step is to recognize that consultants are unlike any other public with which the firm deals. Consultants are not journalists, customers or resellers. However, consultants share some characteristics of each of these.

But they also retain their own unique characteristics. Consultants can claim a permanent sense of insecurity that can be eased by computer firms giving them information and making them feel important. This insecurity afflicts consultants much more than other people because they have no ongoing sense of product sales. Understanding characteristics such as this one is the key to reaching consultants effectively, and computer firms must understand them. So must the supporting cast of public relations firms, ad agencies and free-lance writers.

This understanding is a weak-

*Continued on page 22*

# Supercomputing's latest addition

*Commercially viable, the ETA<sup>10</sup> system should be a welcome commodity*

CHARLES P. LECHT



Supercomputer scientists tell us that the benefits to be gained through supercomputer development in all

sectors of endeavor will so far outweigh the costs that no modern industrial power can live without them.

I cannot help but agree. So it was with no small amount of pleasure that in the summer of 1983, I was present at a supercomputer conference at Los Alamos National Laboratories in Los Alamos, N.M., and heard the announcement of the formation of ETA Systems, Inc., a subsid-

ETA's parent company or Cray Research Corp.

Until ETA delivered the ETA<sup>10</sup>, these two companies led the visible pack of supercomputer producers. ("Visible" because we can assume that the supercomputer work of some others never reaches the public's eye.)

Any measurement of the "absolute performance" of any computer system in millions of instructions per second, floating-point operations per second (FLOPS) or logical inferences per second is difficult at best, and the results are always controversial.

While measuring "relative performance" on a set of identical problems appears to yield

have good cause to be happy. In one class, they managed to produce more than a billion FLOPS.

Just three short years ago, producing 100 MFLOPS was nary possible, so ETA's new system provides a quantum leap in performance.

The equipment ETA used to achieve the FSU results provides us with a definition of a dream supercomputer machine. It was composed of two ETA<sup>10</sup> CPUs, each with four 64-bit megawords (equivalent to 32M bytes) of static random-access memory (RAM). Both processors also shared additional memory of 64 megawords of dynamic RAM.

Apollo Computer, Inc. workstations provided the user interface for the processors, which are encased in liquid nitrogen-cooled cryogenic chambers. According to FSU, the system will be upgraded to four CPUs with 128 megawords of shared dynamic RAM this year. This enhancement should provide far greater still system performance.

## Fortran addicts

The software used in the comparison test was Fortran based, a fact that cannot help but amuse old computer users like myself. To think that after all of the years and all the hullabaloo about new language developments between 1957 (the year Fortran was introduced) and today, the pioneers at the forefront of technology are Fortran addicts.

Of course, we cannot be too surprised that the ETA system produced superior results; CDC is certainly no newcomer to the supercomputer market, especially at the high end. ETA's corporate leadership came from CDC. CDC's Cyber systems technology, along with Cray's, has, for a long time, been yielding the only readily available, commercially viable, "made-in-the-USA" high-end supercomputers.

There are other noteworthy systems offered by reliable U.S. companies, but these supercomputers have either not been around for a long time or are so costly that we would be hard pressed to label them as commercially viable. Of course, we cannot ignore IBM's contributions to the field, but these have been less visible than those of CDC and Cray.

The ETA<sup>10</sup> system, coming at a time when Cray is in the process of redirecting its efforts and several Japanese companies are quickly catching up to their U.S. counterparts, should be welcomed by the U.S. supercomputer community as quite timely indeed.



BILL RUSSELL

itary of Control Data Corp.

ETA would, according to its charter, "design, manufacture, market and support the fastest, most advanced supercomputers" available anywhere. CDC's chairman, William Norris, made the announcement to a group that included the heads of just about every major U.S. organization concerned with the country's defense and well-being.

## Outpacing the parents

In the following years, ETA has fulfilled its charter admirably. The ETA<sup>10</sup>, delivered to Florida State University (FSU) in April of this year and recently ordered by a Japanese group, proves my point. Results reported by three eminent scientists at FSU's Supercomputer Computations Research Institute and one from CDC show the ETA<sup>10</sup> outpaces any system yet produced by

more results, this method also has its problems. The hardware-software mix used cannot help but produce biased results, so we must be careful in evaluating the comparisons, especially those that are reported by the company whose product is deemed superior.

## Vaguely correct

But measure we must, doing the best we can with the facts we've got, this under the premise that a vaguely correct result is better than none at all. In performance comparisons of the same program set — one commonly addressed by the supercomputer community — the ETA<sup>10</sup> beat the pants off CDC's Cyber 205, a Cray-2 and a Cray X-MP Model 48 in almost every calculation offered to the four computer systems.

In the supercomputer business, the speed of computation for various classes of problems is what supercomputing is all about, so the ETA folks may

Lecht is an IDG News Service foreign correspondent, based in Tokyo.

Mallach is a faculty member of the Boston College School of Management and a consultant to user and vendor executives. Based in Needham, Mass., he recently wrote and published *Win Them Over: A Survival Guide for Corporate Consultant Relations Programs*.

## Consultants

CONTINUED FROM PAGE 21

ness of many well-intentioned consultant relations programs. Firms send consultants press releases, invite them to press conferences and prospect seminars. They spend huge sums in these attempts, and their efforts go for naught. Why? Because they don't understand or don't take into account the characteristics of their consultant audience.

To leverage sales successfully via consultants, firms must also define the particular types of consultants they want to reach and the specific characteristics of these types. This is in addition to the general characteristics of all, or almost all,

consultants. Business-oriented advisers who specialize in hospital management systems do not respond to the same approaches as do technically oriented consultants who advise on scientific benchmarks. Business-oriented consultants need product facts at a basic level and no sense of being talked down to; technical ones need "feeds and speeds" information, which they really lap up.

Only when these items are in place can a firm get the most from its consultant relations program. According to Schueler Communications, firms that establish a strong foundation for their programs will obtain more than their share of the \$70 billion that consultants will influence in 1987 — or the even larger amounts consultants will sway in years to come.

*Continued from page 20*

work engine can also serve as the underlying structure for a relational DBMS, then Cullinet can do the following:

- Provide the engine as it is now, with accessible pointers, for people who have to have hot performance or backward compatibility with existing applications.
- Provide the same engine, buried under SQL and an artificial intelligence front-end.
- Build a dynamic link through the common data base engine between the two worlds.

DB2 cannot provide the same flexibility without doing the following:

- Implement a procedural language allowing manual pointer navigation to complement SQL.

- Develop a dictionary comparable to the one available with IDMS/R.

**James Robin Pasley**  
Senior Data Base Administrator  
General Electric Mortgage  
Insurance Co.  
Raleigh, N.C.

## Beneath the layers

In a recent In Depth article, "When you're asked to cost-justify systems . . ." [CW, Aug. 3], the author, A. Perry Schwartz, referred to me as the "principal architect" of a "flawed" model he called TSTS (time-savings/times-salary).

Schwartz was only partially correct in this attribution. While at Booz, Allen & Hamilton, Inc., I was the principal architect of a technique for measuring white-collar productivity gains quantitatively.

However, his perception of a flawed model was itself flawed. Schwartz's criticisms were surprisingly similar to those expressed by Dean Meyer in his recent book, *The Information Edge*. Yet, to my knowledge, neither Meyer nor Schwartz ever had authorized access to the proprietary work we did at Booz Allen that ultimately served more than 50 clients.

Had they been suitably informed, they would have grasped that our work was underpinned by Jack Rockhart's well-proven "Critical Success Factor" (CSF) methodology. Accordingly, we told our clients how office systems could be used to reap professional time misspent on less productive tasks to those activities directly linked to CSFs. Not only were we able to measure the potential reallocatable time but also to counsel how the business units could be reorganized and refocused to capitalize on the improvements.

In that respect, I concur strongly with the direction Schwartz and Meyer are pursuing. We charted that direction as early as 1979. For those who wish to understand what we really did, the highlights, as well as recent refinements, are described in *Information Technology: The Trillion-Dollar Opportunity*.

**Harvey L. Poppel**  
Partner  
Broadview Associates  
Fort Lee, N.J.

# "When I'm word processing with VMWord, my dumb terminal thinks it's a PC."

Now you can have the look and feel of PC word processing when you're using a 3270 dumb terminal. VMWord is designed so even beginners can edit text quickly and easily on the VM system. And what you see is what you get, because the image on the screen is formatted exactly the way it appears on the printed page.

It'll also enable you to add and use a wide variety of laser printers, quickly and easily.

VMWord is available now for the low, introductory price of only \$5,000. For a free, 30-day evaluation copy of VMWord, call Systems & Telecoms today at (703) 391-2712 or mail in the coupon.



Suite 100, 12020 Sunrise Valley Drive  
Reston, Virginia 22091-3405  
Phone: (703) 391-2712  
Telex: 249803 • Fax: (703) 476-5146

### Try VMWord for 30 days at no cost.

No obligation. It's the closest thing to PC word processing.

- ☐ Send me a free evaluation copy of VMWord.
- ☐ Send me more information on VMWord.
- ☐ Please contact me.

Name \_\_\_\_\_

Title \_\_\_\_\_

Organization \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Phone \_\_\_\_\_

Best time to call \_\_\_\_\_

Send to: Systems & Telecoms Inc., Suite 100  
12020 Sunrise Valley Drive  
Reston, Virginia 22091-3405

## This week in history

Oct. 17, 1977

Industry associations are lending their weight to a proposal by the National Commission on New Technological Uses of Copyrighted Work that copyright protection be given to computer programs. But the Computer and Business Equipment Manufacturers Association and the Information Industry Association stress the need for a tighter definition of the term "computer program," which does not currently afford adequate protection to subroutines or program modules.

Oct. 18, 1982

The Department of Defense will begin testing a "smart card," a device the size of a credit card that contains an embedded microprocessor and which will be issued to some 2,000 army personnel to gain admittance to base hospitals and commissaries.



## Who says you have to pay extra to get an ASCII terminal equipped with these three letters?

### Introducing the new family of IBM 3151 ASCII displays.

Now you can have the most versatile ASCII terminals IBM has ever made, for the lowest price IBM has ever offered. Our new 3151 family gives you more functions, and greater compatibility with more ASCII host system computers, for single unit purchase prices starting at less than \$400\* per terminal.

### Three models and up to 16 emulations make them flexible.

The entry level Model 110 comes with 10 non-IBM emulations built in, and provides an 84-key keyboard with 12 definable function keys.

The full-function Models 310 and 410 come with 11 emulations, and are easily capable of more (such as DEC VT220/100/52™ and WYSE WY-50/50 +™) by simply adding a new low-cost, slimline cartridge. Their 102-key keyboards, equipped with up to 36 definable function keys, are also recappable, so you can adapt them to fit just about any program.

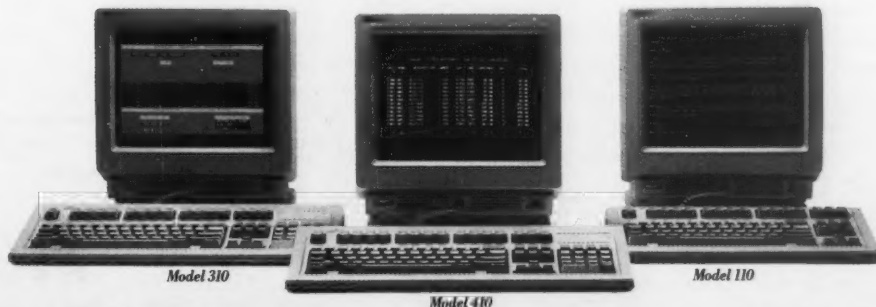
### We worked harder to make them easier to use.

Besides being designed for compatibility with other computers, IBM's new ASCII terminals are more compatible with people. New 14" flat screen displays provide a non-glare viewing surface and smooth scrolling. Our 310 and 410 models also offer a choice of 80 or 132 column displays, with crisp character resolution, in green or amber-gold.

What's more, we built the logic into the monitors, making all three models more compact and more reliable.

However, the most important feature of our new displays isn't on the screen, but above it: the IBM name. IBM provides not only a choice of a one or three year warranty, but a tradition of quality, service and support.

It's no wonder these three letters have come to symbolize so much to so many people. And at these prices, they'll be even more in demand. For additional information, contact your IBM Marketing Representative, or call 1-800-IBM-2468 for a supplier near you.



\*Prices subject to change without notice.

© IBM 1987. IBM is a registered trademark of the IBM Corporation. DEC VT220/100/52 are trademarks of Digital Equipment Corporation. WYSE WY-50/50+ is a trademark of WYSE Technology.



# SOME THINGS YOU CAN'T EVALUATE FROM A LIST OF INGREDIENTS. A DBMS IS ONE OF THEM.



When you think about it, relational DBMS products have a lot in common. They're all built around SQL. Most include 4GL tools. They all have a list of features and functions you can check off one at a time. And they all claim high performance.

But once you really get to know relational DBMS products, the differences between them become as clear as the differences between a great wine and a lesser vintage. It's the care in blending quality ingredients that produces a really great product.

And that's why INGRES is now establishing itself as today's DBMS standard.

INGRES runs on everything from mainframes to minis to workstations and PCs. And our new

INGRES/STAR, the first distributed DBMS, lets users work with data from all your corporate databases and systems. Anywhere in the world. As a result, just like any vintage product, we're recognized by leading experts in the field. INGRES has been voted "Best DBMS/4GL" by *Digital Review* for two years running.

We have also delivered such a consistently high level of customer satisfaction that 99% of our customers stay with us, year after year.

Here's what it all comes down to: You can't tell a great wine from an ordinary one just by reading

the label. And you can't really get to know a DBMS just from a data sheet. That's why we'd like you to experience INGRES first-hand.

Just send in this coupon, or call us. And get a taste of what a superior relational DBMS can do.

Yes, I'd like a taste of INGRES. Please:

- ☐ Send me more information about INGRES.
- ☐ I'd like to attend a free INGRES seminar in my area.
- ☐ I'd like to know more about the INGRES sampler.
- ☐ Have a salesperson call me.

Name

Company

Title

Mailing address

City  State  Zip

Telephone

Mail to: INGRES,  
Relational Technology Inc.  
1080 Marina Village Parkway  
Alameda, CA 94501-9891

Or call: 1-800-4-INGRES

**INGRES**  
Relational Technology Inc.

# SOFTWARE & SERVICES

## SOFT TALK

Charles Babcock

### How to make IBM listen



Jay Goldberg, the chairman of ADAPSO, has attacked IBM's 4-year-old policy of restricting access to its operating system source code in a speech that presages a toughened stance by his organization [CW, Oct. 5].

ADAPSO is about to issue a position paper that will push the group's stand beyond the fruitless negotiations in which it has been engaged with IBM. Although the antitrust suit by the U.S. Department of Justice was dropped, the European Economic Community's case against IBM was only suspended with notice at the time that the source code issue had not been resolved. For starters, the ADAPSO strategists believe they will get a sympathetic hearing there and then move on to build a case with U.S. government agencies.

Although Goldberg threatened litigation during his speech to ADAPSO members in Colorado Springs, his words fall under the heading of saber rattling. The graybeards of the group, veterans of many previous battles, see pressure points like the Common Market as of

*Continued on page 31*

## On-line systems mushrooming

*Study: Heated quest for current information furthers system reliance*

BY CHARLES BABCOCK  
CW STAFF

BOSTON — As businesses seek to compete with more up-to-date information, they are driving the computer industry toward greater and greater reliance on on-line transaction processing (OLTP). That was the conclusion of a recent report by The Yankee Group titled, "The Future of Transaction Processing."

Manufacturers, retailers, financial institutions and inventory managers in all types of companies are among those furthering the need for more on-

line systems.

The market for hardware and software for transaction processing is estimated at \$17 billion this year and is projected to grow 17% per year during the next five years.

#### Tricky trade-offs

On-line systems, however, are more complex to engineer than batch systems. They typically involve shared access to a common data base. For that data base to provide up-to-date information, it must be able to handle simultaneous updates while preserving data integrity.

"Trade-offs are typically re-

quired between operating characteristics. Increasing performance means less data integrity. . . . High availability requires additional hardware and sophisticated data integrity [features]," the report said.

IBM clearly dominates the mainframe side of OLTP with what The Yankee Group study called "several conflicting products," including the IMS file management system, the CICS terminal network teleprocessing monitor and the Transaction Processing Facility (TPF) for specialized transaction processing applications, such as air-

*Continued on page 31*

## Tool turns diagrams into code

BY CHARLES BABCOCK  
CW STAFF

WALTHAM, Mass. — A computer-aided software engineering (CASE) tool that generates applications for the Digital Equipment Corp. VAX from a design and diagramming tool on an IBM Personal Computer AT has been announced by Cortex Corp.

The CASE product, Corvision, is one of the first to tightly link a design and diagramming front end to an application generator. The generator, however, produces applications in a Cortex proprietary language called Builder code.

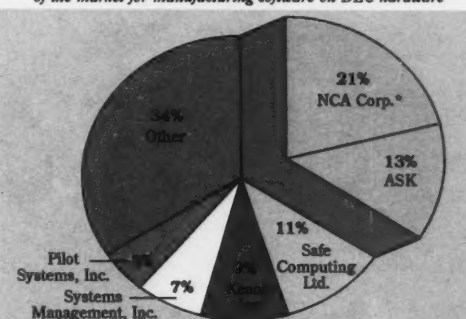
Cortex officials said the proprietary code should not matter because applications can be modified using the front-end specification and diagramming process. Some users, however, are likely to ask how they will get precisely the applications they want without a trained stable of Builder programmers.

*Continued on page 29*

## Data View

### Stacked deck

ASK's acquisition of NCA resulted in a greater than one-third share of the market for manufacturing software on DEC hardware



\* Acquired by ASK Computer Systems, Inc.

INFORMATION PROVIDED BY INTERNATIONAL DATA CORP. CW CHART

## Unix gets CICS link

BY SUZANNE WEIXEL  
CW STAFF

EMERYVILLE, Calif. — Unisoft Corp. recently announced Unitecs, an IBM CICS emulation package for computer systems running the Unix operating system.

Unitecs is said to provide Unix-based systems with IBM compatibility as well as with emulation of the major features of CICS.

According to John G. Lax, the director of Unisoft's Commercial Systems Division, there are

*Continued on page 33*

### Inside

- Interbase Software releases relational DBMS upgrade for engineers. Page 29.
- Computer Information Systems adds macro I/O routines to resource manager. Page 33.

## Emc<sup>2</sup> OFFICE AUTOMATION Power through Simplicity™

Be recognized for bringing about new office productivity to your company. Select the preeminent Electronic Mail and Document Connectivity Tool for IBM mainframes — Emc<sup>2</sup>.

Emc<sup>2</sup> is so easy to learn, even your computer novice can use it right away. It is so resource efficient, it easily supports tens of thousands of users in the data base, with many hundreds concurrently

on-line. And it runs under any standard MVS, VM, or VSE teleprocessing environment you care to use, either now or in the future.

You get universal connectivity with Emc<sup>2</sup>. It communicates between TSO, CICS, CMS, IMS, IDMS, VAP\* and FIVS.\* It provides interfaces to DISOSS, PROFS, and Western Union services (Telex, Mailgram, etc.). And it provides seamless PC

file transfer (including PC binary files) for over a dozen PC boards and adaptors.

Emc<sup>2</sup> is full featured and fully supported. (Emc<sup>2</sup> innovated many electronic mail features now considered standard, and more are on the way.)

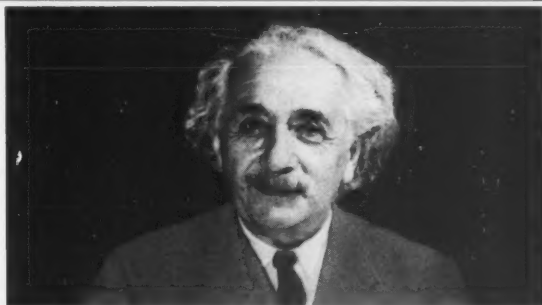
And Emc<sup>2</sup> is preferred time and again. Users who compare Emc<sup>2</sup> with other electronic mail and document transmission systems select Emc<sup>2</sup>.

Call 800-237-4510 for a free trial or more information. (In Florida, call 813-643-1500.) Then get ready to claim the benefits of being known as your company's genius.



4073 Merchante Avenue Naples, Florida 33942

\* Emc<sup>2</sup> supports its own super-economical, multi-user environments to vastly enlarge the population that can use it. VAP is a special VTAM application for MVS and VSE. FIVS is the multi-user Fischer International Virtual System for VM.  
Copyright © 1987 by Fischer International Systems Corporation. All rights reserved.



A box is a box  
is a box.



## Let's talk about the Memorex product line.

Once you've entered the IBM® arena, you have many choices.

And very few choices.

You can purchase IBM from IBM and subject yourself to the mercy of working with "IBM only" solutions.

Or, you can buy IBM-compatible computer products from numerous vendors and piece together a system yourself.

Then wrestle with the uncertainty of wondering who to call when something goes haywire somewhere between this box and that.

We know neither choice is totally acceptable.

And we'd like to change that for you.

But who are we?

Let's talk:

First, you should know that, aside from IBM, we're the only computer products company in the world to sell a full line of IBM-compatible

computer products (everything from mass storage and communications equipment to Systems 3X peripherals, magnetic media and a host of other computer supplies).

Yes.

Memorex. We are *the* single source alternative to IBM. Both nationwide and worldwide.

But product selection is only the beginning of the choices you can expect from us.

We have the will. And we have the ways. Ours is a 26-year commitment to your complete satisfaction. In 76 countries throughout the world. (The only continent we're not on is Antarctica.)

It means putting systems together that work precisely the way you want them to work.

Even if it requires modifications in the hardware we sell and the software that works with it to give you a better fit. A smoother more

efficient running system.

Whatever it takes.

And if something should ever go down, there's no question who to call for parts and service. Because with Memorex you end up with equipment under one brand and one guarantee:

We'll be at your side to make critical system equipment repairs in two hours or less.

Are you still listening? Because there's so much more to talk about. Like our objective advice, aggressive financing and immediate delivery.

Just dial 1-800-CALL-MRX and let us know how we can help you.

When you think about it, your choice becomes very simple.

You can buy a box from someone else. Or you can buy a company called Memorex.

**Let's talk.  
1-800-CALL-MRX.**



**MEMOREX**

**To learn more about the  
industry leaders' latest  
ideas on data entry. . .**

**Cut these out and put them on.**



**Introducing OPTIONS™ from UNIBASE:  
The Key to Vendor Independence.**

*Vendors like Nixdorf®, Recognition® and many others sell "traditional" data entry systems. Systems that bind you to obsolete hardware, proprietary software and single-purpose technology. Systems that make you a prisoner of high maintenance costs.*

*Now you have the freedom to grow with OPTIONS from UNIBASE. OPTIONS for data entry and departmental computing that utilize industry-standard hardware and software (UNIX® and MS-DOS®) in flexible, multi-purpose systems.*

*If you're ready to replace your old data entry system, or if you're thinking about integrating data entry with departmental computing, then it's time to discover the freedom of OPTIONS from UNIBASE:  
**The Key to Vendor Independence.***

*For more information, call UNIBASE today at (801) 649-4440.*

**UNIBASE™**

**Unibase Systems, Inc.  
1500 Kearns Boulevard  
Park City, UT 84060**

©1987 Unibase Systems, Inc. The Unibase logo and OPTIONS are trademarks of Unibase Systems, Inc. UNIX is a registered trademark of AT&T. MS-DOS is a registered trademark of Microsoft Corporation. Recognition is a registered trademark of Recognition Equipment Incorporated. Nixdorf is a registered trademark of Nixdorf Computer Corporation.

# Interbase upgrades DBMS for DEC, Sun environments

TYNGSBORO, Mass. — Interbase Software Corp. earlier this month introduced an upgraded version of its relational data base management system for Digital Equipment Corp. minicomputers and for workstations from Apollo Computer, Inc. and Sun Microsystems, Inc.

The small company, which has built a customer base of 40 users since the product's introduction last year, is taking aim at a highly competitive market.

The firm said it plans to target the system, which is also called Interbase, at engineering and other compute-intensive markets.

The new release was revamped to appeal to end users, according to Ann Harri-

son, design engineer.

For example, Version 2 has a utility to create screens for data entry, updates and retrieval. A standard-screen format is provided for users who do not wish to create their own.

The previous version of Interbase, which was targeted at sophisticated application developers and OEMs, displayed data in table formats and entries were made in a command-line format, Harrison said.

The system was designed for work group environments in which large volumes of data are shared among users. The company has incorporated some features of a distributed relational DBMS for that purpose.

Users on different workstations can access and update data residing on a different CPU, Interbase claimed.

However, the system does not support a global data dictionary, a key requirement for a distributed system, industry observers said.

The software supports the IBM DB2 version of SQL while also using proprietary technology, such as its own data manipulation language, according to the vendor.

Interbase also supports industry-standard

communications protocols, such as Transmission Control Protocol/Internet Protocol and DEC's Decnet.

The program will run under both DEC's VMS operating system and Ultrix, a Unix operating system, as well as Apollo's and Sun's own versions of Unix.

## Finding a niche

"We're not aiming at traditional markets," said Lawrence Wiensczak, director of marketing for Interbase. "There's too much competition there. So we have to establish ourselves someplace else."

The system is scheduled to be generally available at the end of this month.

Licenses range in price from \$5,000 to \$75,000, depending on the size of the hardware.

## Diagrams

CONTINUED FROM PAGE 25

The application generator is known as the Application Factory, an established Cortex product on the VAX. Most application generators produce about 80% of the application desired.

### Factory boosts production

Cortex President Craig Hill said the Application Factory, when tied to the personal computer-based front end, will produce 95% to 98% of an application. Program developers can finish the application in Builder code or any native VAX third-generation language, he said.

Applications built with Corvison use DEC's Record Management System and relational data base management system, RDB, Hill said.

Corvison uses a technique called picture programming, which uses a set of diagramming symbols to define data types, relationships, menus, screens and reports.

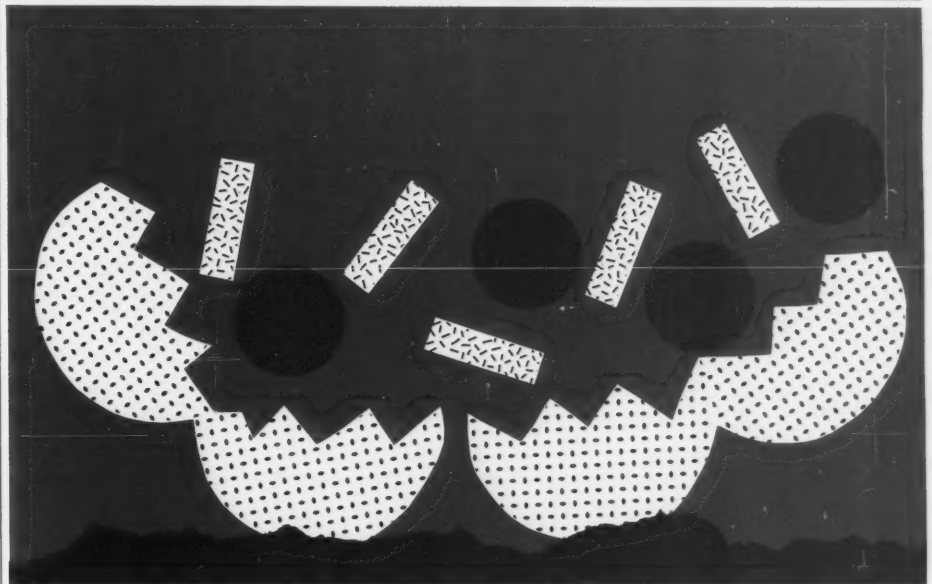
A central repository on the VAX stores all design information and enforces consistent use of design symbols, Cortex officials said.

A guidance system in the repository prompts the developer on the next logical step in the development process.

Du Pont Co. uses Corvison and the Application Factory in a rapid prototyping process that company spokesmen said increases end-user involvement and speeds the development process.

Since April, Du Pont has been an investor in Cortex, a privately held company.

Du Pont recently formed a subsidiary, Information Engineering Associates, to build custom VAX applications using the Cortex products.



# Data Base Creator.

Address all your DL/I or IMS data base testing requirements—from test data base creation through comprehensive restructuring—with DataVantage™.

DataVantage makes it easy to create a test data base. All you do is set up your selection criteria, and DataVantage automatically assembles an accurate cross section of your data base. Your criteria may be as selective and complex as you wish. With DataVantage you'll avoid wasting valuable time hand-coding to create test data bases.

In addition, our Data Base Access Facility allows you to query and globally update your data bases on-line under CICS, IMS DB/DC, TSO/ISPF, or in batch mode—eliminating the need for "one time only" programs.

You may list any portion of a data base, change data and add or delete segments to meet your needs. And with DataVantage's unique SAVE/REFRESH feature,

you can quickly and easily restore a test data base to its original condition after it's been altered by testing.

DataVantage logically compares data bases before and after testing, and shows you the differences, eliminating the need to wade through data base dump output.

Create a manageable data base environment with DataVantage. Call today to request a copy of our free informational diskette, a 30-day product trial or information on our reseller program.

800-642-0177

In Canada, 416-671-2272/Europe, 44-1-631-3696



On-Line Software International  
Authorities in IBM® Software

## DataVantage. The Leading IMS & DL/I Data Base Testing Tool.

On-Line Software International, Inc. Two Executive Drive, Fort Lee, NJ 07024

IBM is a registered trademark of International Business Machines Corporation.

### ORACLE USERS

SQL\* is:

- A powerful report writer
- A procedural language
- A batch update facility
- A load/unload utility
- A great tool for Oracle users!

SQL\* is available for IBM-PC, VAX/VMS, DG-MV/AOS. Call for more information. Evaluation kits available.

SQL Software, P.O. Box 21171  
Cleveland, OH 44121 (216) 397-0551  
In Australia: Sequel Pty Ltd. (03) 615-0033



# NOW YOU CAN HAVE THE MODEM YOU'VE ALWAYS WANTED AT A PRICE YOU NEVER DREAMED YOU COULD GET.

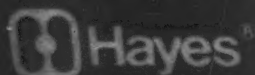
At Hayes we just found a way to make the best-selling PC modems in the world even better. We lowered their price. From now on our Smartmodem 2400, Smartmodem 2400B, Smartmodem 1200, Smartmodem 1200B, Smartmodem 1200C, and our new Smartmodem 1200A will cost considerably less. Up to one-third less.

So if you've always wanted a Hayes modem, external or internal, for an IBM PC or compatible, IBM PC Convertible, Apple Macintosh, Apple II, or almost any other PC, now you don't have to settle for less. Just pay less.

## Hayes®

© 1987 Hayes Microcomputer Products, Inc. PO Box 105203 Atlanta, GA 30348 404 441 1617  
\*Based on estimated retail prices \*\*Requires external modem

SMARTMODEM 2400



HS

AA

CD

OH

RD

SD

TR

MR

## Make IBM listen

CONTINUED FROM PAGE 25

fering the greatest opportunity for making IBM listen.

Goldberg also cited the recent IBM arbitration agreement with Fujitsu that gave the Japanese firm access to IBM source code — at a price. "It is unthinkable that Japanese software developers be given access to IBM operating system source code while American companies . . . are excluded," he said.

This was a jab at IBM that probably sent a stable of lawyers in Armonk to write briefs. The arbitration agreement set no legal precedent, and few ADAPSO members are confused on that point.

What is at issue here is the ability of independent software companies to build complementary products for environments supplied by IBM operating systems. IBM will say it isn't necessary to release source code because the company publishes interfaces that allow software developers to tie products to the operating systems and the related subsystems.

The interface option is a limited and would eliminate many products now available if developers are restricted to using the hooks in the base system, according to Marty Goetz, chairman of ADAPSO's IBM interface committee.

Performance monitors, for example, cannot do their job when held at arm's length from the operating system by an interface. Stan Rintel of Sylogy in Tea-

neck, N.J., has told ADAPSO members that he could not have developed a compiler to track changes in an IBM Cobol program and only recompile the changed lines, a time-saving innovation, if he hadn't had access to the source code. When IBM announced VS Cobol II, it declined to reveal the source code; thus, Rintel said, he cannot write a similar product for the latest stripe of Cobol.

If IBM wishes to claim proprietary source code, it seems logical for ADAPSO members to insistently note that IBM holds a near monopoly on operating systems, a condition that dates back to the time when the company gave away the operating system with the hardware. This continued for 10 years after IBM "unbundled," Goetz noted. By the time

it stopped, IBM operating systems were entrenched with thousands of applications written for them.

The underlying rationale for the American Arbitration Association agreement was that customers of both companies were best served by a period of predictable compatibility, with Fujitsu making an aboveboard payment for the privilege. A stronger rationale would apply for customers of U.S. companies to have the right to know their vendors have a competitive chance to keep up. If IBM denies them that, we must ask how so much power came to be concentrated in one company in the first place.

Babcock is *Computerworld's* senior editor, software & services.

## On-line systems

CONTINUED FROM PAGE 25

line reservations.

In the minicomputer field, competition is heating up between Digital Equipment Corp. and the minicomputer makers that have specialized in transaction processing, particularly Stratus Computer, Inc. and Tandem Computers, Inc.

New 32-bit workstations like DEC's Vaxstation 2000, IBM's Personal System/2 and Sun Microsystems, Inc.'s Sun-3 have the potential to perform as transaction processors, and software to harness them is "less than a year away," according to the report.

### Coping with trade-offs

But software suppliers at all three levels are struggling to deal with the trade-offs involved.

The OLTP systems of the large airlines push 1,500 transaction/sec. through their reservations systems, while most systems are geared toward the 1 to 10 transaction/sec. rate more typical of applications today.

The Yankee Group said it expects the next generation of IBM mainframes to double the 200 transaction/sec. rate that is typical of an IBM 3090 Model 200 running TPF.

With software geared to four to eight parallel processors, "it is likely that 3,000 transaction/sec. can be achieved by 1991," the report stated.

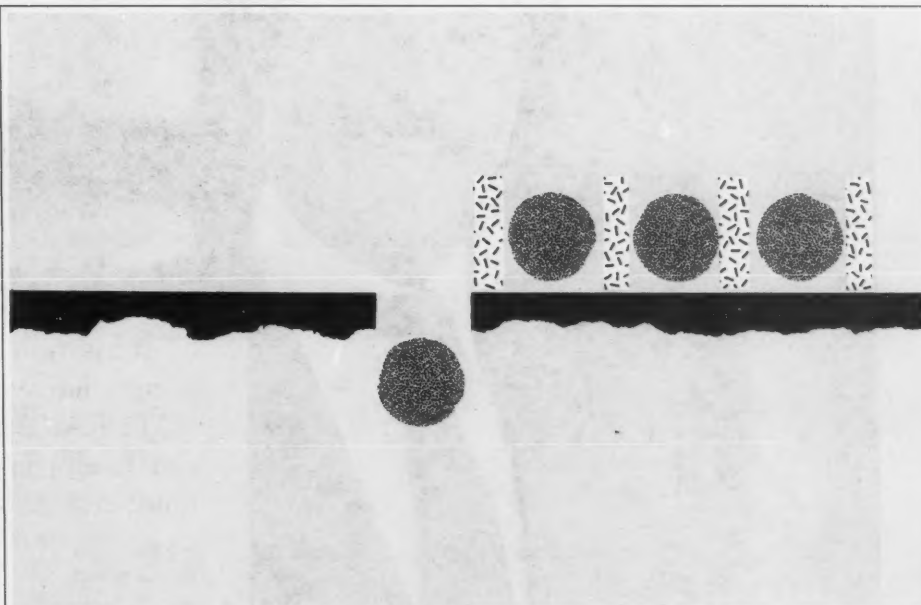
### Unix false hope for newcomers

A number of start-up vendors have chosen Unix as a way into the market, citing Unix's portability feature. But Unix lacks OLTP foundations, as was discovered by Auragen Systems Corp., Synapse Computer Corp. and Enmasse Computer Corp., start-up companies that died while trying to enter the market, the report noted.

Tandem, with its Nonstop SQL, offers a VLX system capable of the mainframe-like 200 transaction/sec. rate, the report noted.

DEC has the most to gain or lose in the transaction processing field. Its VAX system meets the needs of many users today, but the report describes the firm's hardware and software as "offering mediocre on-line transaction processing functionality" and needing to be replaced by new products during the next three years.

"If not, Digital's strategy of attacking rapidly growing commercial markets like financial services could falter," the report said.



## Bug Catcher.

InterTest® is the sophisticated, interactive debugging and testing tool that catches bugs before they wreak havoc on your complex CICS environments.

InterTest lets you set and remove program stops, control program execution, and inspect and modify program variables directly from complete COBOL, COBOL II, PL/I or BAL source listing displays. Your CICS debugging will be faster, easier and more effective than ever before.

In addition, InterTest detects and prevents all application errors known to CICS. It puts you in control when an impending error is detected, rather than allowing CICS to terminate your transaction. You can correct or bypass errors right away—without wading through transaction dumps—and then resume testing without losing valuable time.

Best of all, InterTest's programmer-friendly menu screens and comprehensive Help Facility enable you to become more productive right away.

InterTest. It lets you catch the bugs before your programs go into production. Call today to start your 30-day product trial or for more information on InterTest. Find out for yourself why over 2,000 companies have made InterTest the industry standard. Reseller programs available.

800-642-0177

In Canada, 416-671-2272/Europe, 44-1-631-3696



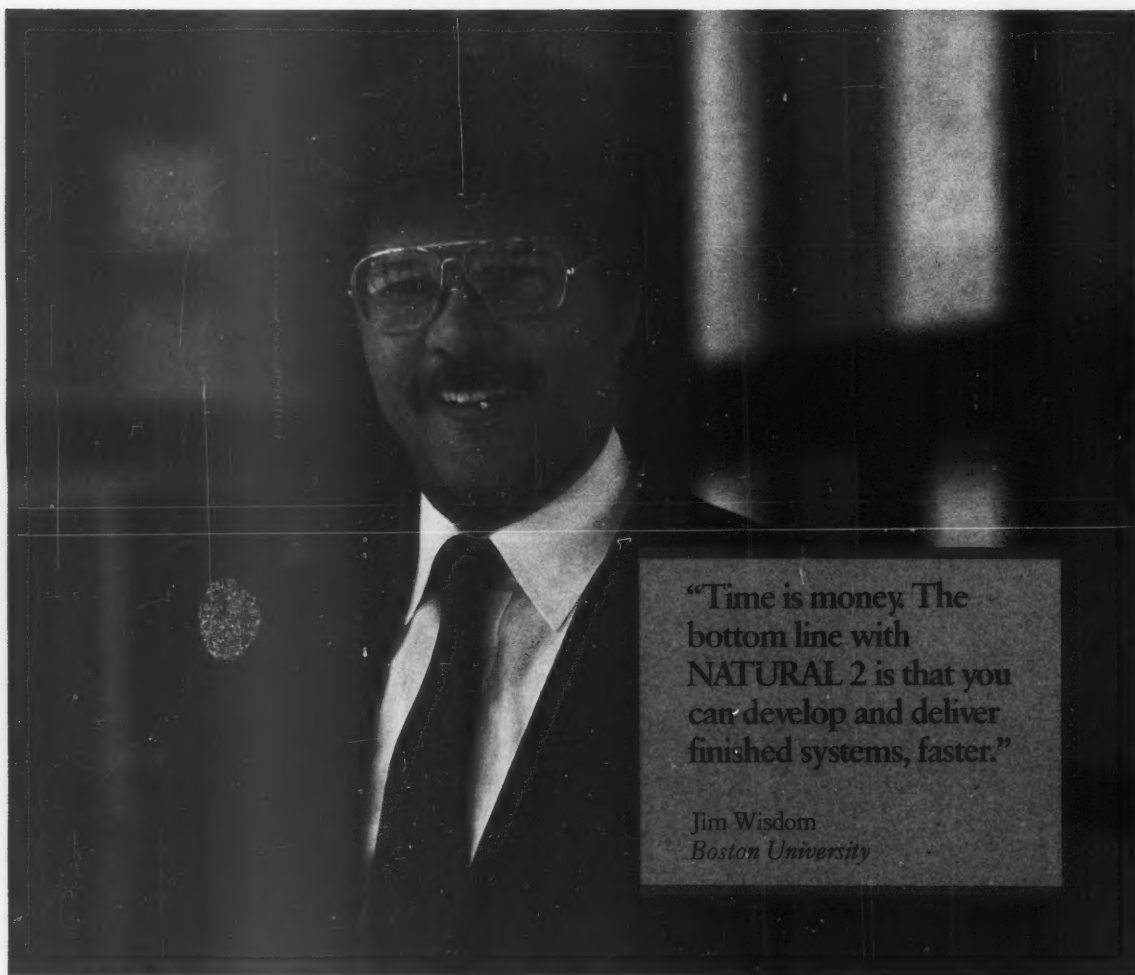
On-Line Software International  
Authorities in IBM® Software

**InterTest. The Industry Standard for Interactive CICS Debugging and Testing.**

On-Line Software International, Inc. Two Executive Drive, Fort Lee, NJ 07024

IBM is a registered trademark of International Business Machines Corporation.

## NATURAL 2 and the bottom line.



"Time is money. The bottom line with NATURAL 2 is that you can develop and deliver finished systems, faster."

Jim Wisdom  
*Boston University*

Jim Wisdom can be a tough critic. Tough, but fair. Speaks his mind. That's why we asked him to beta test NATURAL 2.

That's also why his reactions are so nice to hear.

"NATURAL 2 gives you everything you need to develop and deliver online systems, completely and thoroughly," he says. "With NATURAL 2 and other Software AG products, our end users themselves can develop systems that go into production. Not many people can say that."

For reasons like these, NATURAL has become the *de facto* standard for applications development at Boston University—and at nearly 2500 other sites around the world. Which is also nice to hear.

Discover NATURAL 2. The Next Dimension in 4th Generation technology.

**For a free NATURAL 2  
presentation diskette,  
call: 1-800-843-9534**

(In Virginia or Canada,  
call 703-860-5050)

**SOFTWARE AG**  
PROGRAMMING BUSINESS SUCCESS



## CICS link

CONTINUED FROM PAGE 25

three areas in which the company expects Unitecs to be most beneficial. They include developing and maintaining CICS Cobol applications on a mainframe in a Unix environment, moving existing CICS Cobol applications from mainframes to Unix systems and developing transaction-processing applications on Unix systems using the available pool of Cobol/CICS programmers.

"In overloaded departmental computing environments," Lax said, "Unitecs allows CICS applications to be developed on Unix systems, and it produces code that can be moved onto a mainframe for system test and real-time multitasking use."

Unitecs is said to provide full CICS emulation for applications that are written in Cobol. It also reportedly uses command-level CICS, DOS or MVS to Release 1.6 and 1.7 standards of CICS, processes VSAM/DL1 files and handles IBM 3270-type display terminals through Minimum Function Basic Mapping System.

The major components of the Unitecs environment include a Cobol runtime sys-

**I**N OVERLOADED departmental computing environments, Unitecs allows CICS applications to be developed on Unix systems, and it produces code that can be moved onto a mainframe for system test and real-time multitasking use."

JOHN G. LAX  
UNISOFT CORP.

tem from Micro Focus, Inc.'s Micro Focus ET or VS Cobol compiler with extensions to accept calls to Unitecs functions; Cobol application programs written with embedded commands that are passed to the Unitecs Run-Time; and the Unitecs

Run-Time, which includes additional runtime routines that intercept I/O requests from application programs and pass them to the relevant system processes.

Also included are a screen handler, a file-handling system, system control and

development tools.

Additionally, Unitecs provides access to such Unix development tools as Shell scripts, file-comparison programs and Make facilities.

Unitecs' memory size, processor speed and disk capacity are determined by the requirements of the installation.

Pricing is set in relation to the size of the processor. For a sample configuration in which the processor, disk and memory cost less than \$20,000, a Unitecs development environment is priced at \$8,000.

End-user versions will be available next month for Sequent Computer Systems, Inc.'s Balance, NCR Corp.'s Tower 600, Hewlett-Packard Co.'s Precision Architecture systems running HP/UX and the IBM 6150, the vendor said.

## Quantum RS manager tool adds macro I/O

BRAINTREE, Mass. — Computer Information Systems, Inc. recently enhanced its Quantum RS resource management software for Digital Equipment Corp. VAX/VMS systems to incorporate macro I/O routines.

Because the new I/O routines interface directly with DEC's VAX Record Management Services, Quantum RS Version 4.2 operates up to 45% faster than the previous release, company spokesmen said.

The product features the ability to collect resource usage information automatically or interactively at user-specified times. It accounts for resources used more than a maximum of six shifts, allowing an account of a user session that spans several shifts. It also accounts for resource usage across nodes and clusters.

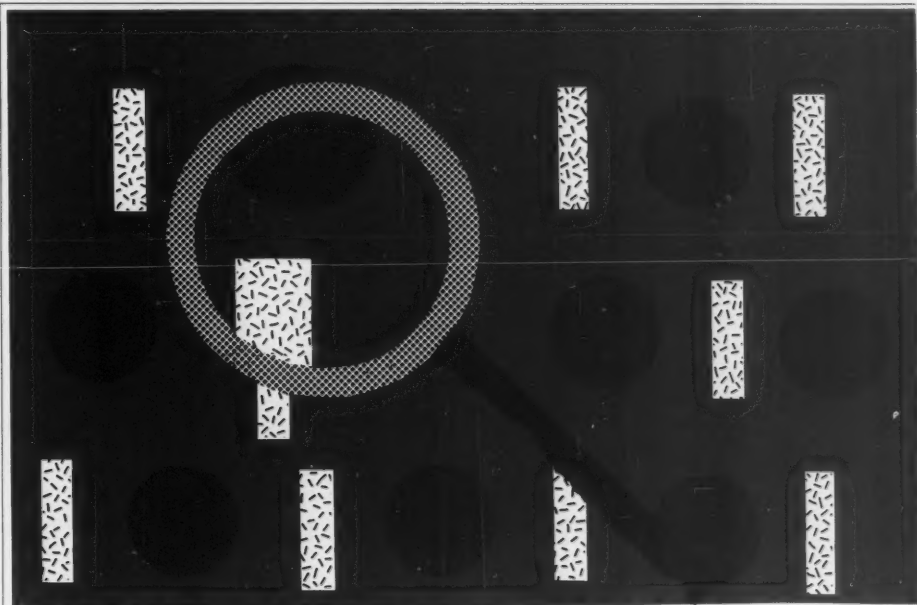
Twelve reports providing more than 35 performance and statistical measures are available, according to the vendor. Thirty resource and sales figures are available as well.

Additional enhancements include redesigned project accounting programs said to offer increased flexibility and to require less overhead. Users can call their own project verification routines supplied with the software.

A simplified product installation procedure that uses the VMSINSTAL utility has also been added. In an attempt to simplify user management and data management functions, macro commands that facilitate setup, adjustment and deletion of multiple items are included.

Available now, Quantum RS Version 4.2 operates on DEC Vaxclusters, VAX networks and single CPU environments on all versions of VMS 4.0 and later.

Licenses for the first CPU are priced from \$2,500 for the DEC Microvax II to \$12,000 for the VAX 8800 series.



## Quality Checker.

VERIFY™ is a powerful QA testing tool that lets you deliver reliable, high performance CICS systems and applications time after time. It automates new or modified application testing, from simple program tests to the most complicated stress testing.

With VERIFY, you enter test data only once. The automated logging function permanently stores screen dialogues on a file. You can then browse and customize your test stream dialogues with a variety of powerful on-line edit and utility functions. VERIFY is then ready to retest any portion of your system, giving you the flexibility to control the application mix, input values and arrival rate of the transactions to be re-executed on CICS.

Through an on-line menu display, you can see the exact differences VERIFY discovers during its interactive comparison. And respond immediately with two full menus of mismatch processing options.

In addition, VERIFY provides several levels of in-depth security for your data, with options like "dark field protection" and "test stream protection." VERIFY works with 3270's, 3600's, 4700's, TWX's, and most other devices.

VERIFY. It helps you get it right the first time. Call today to start your 30-day product trial or for more information on VERIFY. Reseller programs available.

800-642-0177

In Canada, 416 671-2272/Europe, 44-1-631-3696



On-Line Software International  
Authorities in IBM® Software

**VERIFY. The Leading Quality Assurance/System Testing Tool.**

On-Line Software International, Inc. Two Executive Drive, Fort Lee, NJ 07024

IBM is a registered trademark of International Business Machines Corporation.

Lotus 123



## Lotus would like to explode the myth that we're a one product company.

Actually, we're a heck of a one product company, if all you need is a great spreadsheet.

Lotus 123



Or, we're a two product

company

Lotus HAL



if you want to get even more out of your spreadsheet. Okay, we're a three product company if you

want an all-in-one graphics package, too.

Lotus Freelance Plus



Or, we're a four product company if you want to incorporate all

Lotus Manuscript



this into an impressive document. To tell the truth, as long as our products work together, we really are a

one product company. Lotus.<sup>®</sup> By working together, our products help you gather, analyze, present and communicate

information, improving your organization's decision-making. For example:

Lotus TAC



With The Application Connection,<sup>™</sup>

you download data from a mainframe

Lotus Symphony



into your PC spreadsheet for analysis. Then automatically create

graphs

Lotus Graphwriter II



from your spreadsheet data using Graphwriter II.<sup>®</sup> Include those graphs in a report using Lotus

Manuscript.<sup>®</sup> Then transmit the report to another PC using Lotus Express.<sup>™</sup>

Lotus Express



Because our products have

a common user interface, your people can

Lotus Signal



Lotus Metro



learn new products



more

quickly and be more productive sooner. At Lotus, we're working to help you optimize your investment in microcomputing:

### The Lotus System

Information Products

Analysis Products

Presentation/Communications Products

hardware, software, applications, data, training and support. Lotus. You're not likely to

find a more diversified one product company.

# Lotus

## NEW PRODUCTS

## Systems software

**Global Scan/Replace Source**, a software product designed for use on the IBM System/38, has been announced by **Golden West Software**.

The program is said to allow users to scan source files for character strings and automatically change each occurrence of the string with a different character string. Additionally, the user can automatically recreate objects after the source has been changed.

Global Scan/Replace Source can search and replace any string of up to 40 characters. It supports numbers as well as uppercase, lowercase and wild-card characters.

With source, the program costs \$725. Without source, it costs \$475.

Golden West Software, 11442 Gettysburg, Norwalk, Calif. 90650. 714-850-6241.

## Applications packages

**Mass-11 Calendar Management**, a time management package designed for Digital Equipment Corp. VAX systems and IBM Personal Computers, has been announced by **Microsystems Engineering Corp.**

Users can automatically block time for meetings and appointments and label appointments according to priority. Continuous reminders about upcoming events can be set up, past calendar information can be archived and a list of all meetings relating to a particular subject can be compiled.

Pricing is \$5,750 for VAX computers 8500 and larger; \$2,875 for VAXs between 11/780 and 8300; and \$1,850 for the Microvax II, 11/730 and 11/750. Software for the Vaxstation 2000 costs \$995. The PC version costs \$195.

Microsystems Engineering, Suite 400, 2400 W. Hassell Road, Hoffman Estates, Ill. 60195. 312-882-0111.

## Utilities

**Help/Key**, a product said to provide Help facilities to CICS users, has been announced by **Main Frame Software Products, Corp.**

Help/Key enables users to create and maintain on-line documentation and Help messages for on-line applications. Users can incorporate such facilities as Help windows and field-level Helps. Help screens can be created interactively directly from the transaction screen utilizing the facilities of IBM 3270-type terminals.

Help/Key uses standard command-level CICS and is compatible with all current releases of CICS running under the VSE and MVS operating systems. License fees range from \$7,900 to \$9,900.

Main Frame Software Products, 135 Glen Road, Wellesley, Mass. 02181. 617-239-0288.

## Data base management systems

A relational data base management system for Unisys Corp.'s Sperry 1100 mainframe has been announced by **Amperif Corp.**

The system, called the **Amperif**

**RDM/2**, is an integrated hardware/software solution said to use special-purpose controllers to interface with the host mainframe. It features support for SQL as well as Amperif's own relational query language. Data base management functions are off-loaded from the host, and shared access to common data bases is provided for up to four mainframes.

Depending on configuration and amount of storage capacity, the RDM/2 is priced from \$240,000 for a 1.3G-byte configuration to \$520,000 for an 11G-byte configuration.

Amperif, 9232 Eton Ave., Chatsworth, Calif. 91311. 818-998-7666.

## Training software

**Advanced Systems, Inc.** has added a course called **Technology Perspective: IMS/VS Version 2 — Is It Right For You?** to its Technology Perspective series of training programs.

The video-assisted course was designed to introduce the major components of IBM's IMS/VS Version 2. Viewers are said to learn to recognize the basic components of IMS/VS Version 2.

The course is 30 minutes long and may be rented for \$50 to \$150 per month, depending on rental volume.

Advanced Systems, 15 E. Algonquin Road, Arlington Heights, Ill. 60005. 312-981-1500.

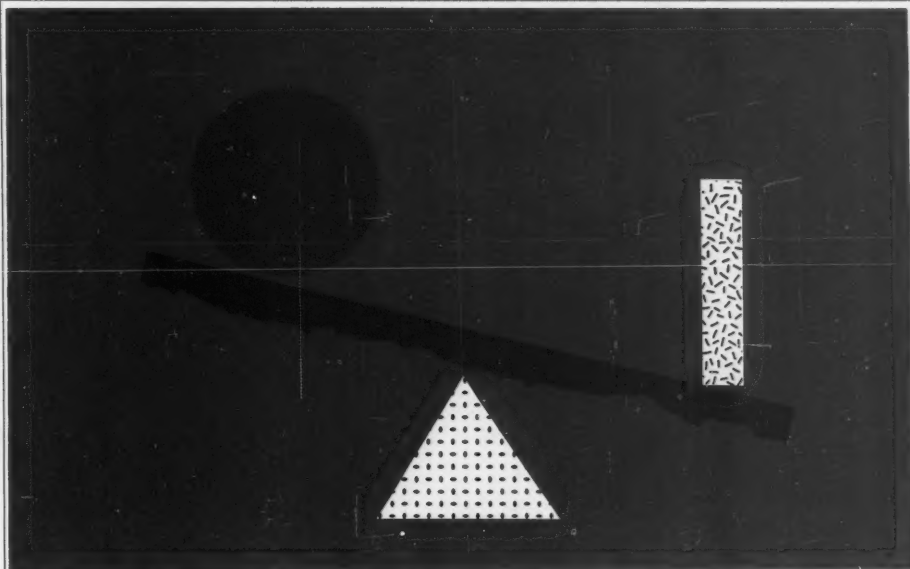
## Development tools

**Signal Technology, Inc.** has announced **Version 5.1** of the **Smartstar 4GL** application development system.

Enhancements include a fourth-generation language facility for creating scrolling regions using only keypad commands; scrolling features allowing for viewing and management of multiple data items on the screen; and fourth-generation language support to data movement functions, including movement across different data base file structures.

Smartstar is priced from \$7,000 to \$55,000.

Signal Technology, 5951 Encina Road, Goleta, Calif. 93117. 805-253-5787.



## Stabilizer.

No matter how smoothly your CICS operations are running, problems can develop that seriously affect your system's stability.

**STABILIZE™** from On-Line Software repairs abnormal CICS system conditions in real time, which dramatically increases your system availability. It automatically detects and repairs system abends and loops on-line. And, to prevent problems from recurring, diagnostic data is available on-line or in a complete, concise report—reducing the need to wade through large portions of system dumps.

**STABILIZE** can protect all of your CICS regions simultaneously. And you can vary the levels of **STABILIZE** protection—from diagnostics only, to CICS protection with full data integrity—depending on the needs of your test and production regions.

In addition, **STABILIZE** corrects corruption of TCA, LIFO Stacks, Register Save Areas, CICS Systems Recovery abend loops and vital CICS tables. And best of all, **STABILIZE** won't degrade your response time while CICS is running.

**STABILIZE** your CICS system. Call today to request a copy of our free informational diskette, a 30-day product trial or information on our reseller program.

**800-642-0177**

In Canada, 416-671-2272/Europe, 44-1-631-3696



**On-Line Software International**  
Authorities in IBM® Software

**STABILIZE. The Automatic CICS System Repair/Diagnostic Tool.**

On-Line Software International, Inc. Two Executive Drive, Fort Lee, NJ 07024

IBM is a registered trademark of International Business Machines Corporation.



# INTRODUCING A NEW WORD FOR TANDEM AND STRATUS.



The fast world of transaction processing has a new speed limit. Because Sequoia has just introduced the Series 200: a fault tolerant system that delivers faster performance at a far lower cost per transaction. In fact, as these audited test results prove, Sequoia dramatically outperforms both Tandem\* and Stratus.\*

TRANSACTION BENCHMARK RESULTS <sup>(1)</sup>			
	SPECS:	Trans. Per Sec.	Cost/Transaction <sup>(4)</sup>
<b>SEQUOIA<sup>(2)</sup> SERIES 200</b>	<b>6 Processors</b>	<b>83</b>	<b>\$11,200</b>
TANDEM <sup>(3)</sup> VLX	4 Processors	26	\$38,200
STRATUS XA2000	4 Processors	50*	\$16,600

\*Results produced without transaction protected files.

<sup>1</sup> Based on standardized ETI Benchmark. Results published by FT Systems Newsletter, 1987 (TOM Inter. Co.). <sup>2</sup> Audited results published 10/12/87. <sup>3</sup> Using NonStop SQL. <sup>4</sup> Prices for systems: Sequoia \$929,000; Tandem \$995,000; Stratus \$630,000.

And with Sequoia, you finally have the capability to add pure power as you add processors, with no degradation.

## ARCHITECTURE THAT MEANS HASTE WITHOUT WASTE.

Sequoia's elegant, tightly coupled architecture is a significant new step in the evolution of fault tolerant transaction processing.

It balances work dynamically, to make sure you get maximum productivity at all times.

It eliminates both the overhead of a loosely coupled system, and the complex application design that's normally required for high performance. That makes linear expandability a virtual reality: when you double your processors, you can double your performance.

And with the Sequoia Series 200, you can expand your system piece-by-piece, adding processing, memory or I/O modules in any configuration you want. A remarkably cost-effective way to grow as large as you want at your own pace.

## FAULT TOLERANCE: THE PLUS OF "PLUS 1."

The Sequoia Systems Series 200 also eliminates some of the faults of other fault tolerant systems.

Instead of using a software

approach, which by nature is complicated, costly, and inefficient, we built fault tolerance into our hardware. But, unlike systems that require double the hardware, with a backup for every primary processor, we have a much more effective solution: "PLUS 1."

Sequoia is able to achieve redundancy with just one more processor than normally required. When a fault is detected, the failed processor is taken off-line, and the workload is dynamically balanced among the remaining processors.

## NOW UNIX AND PICK ARE IN FAST COMPANY.

For maximum hardware flexibility and software portability, Sequoia supports the most popular industry standards, including UNIX.<sup>™</sup> We also bring new power to the world of PICK<sup>™</sup> users. And our open communications architecture allows you to connect to other systems through IBM protocols or international standards like X.25.

So if you'd like to transact business at a record pace, now is the time to learn more about how the Sequoia Series 200 can help you. Send us the coupon, or better yet, call our Marketing Services Department: **617-480-0800**.

Please send me more information on the SEQUOIA Series 200.  
Sequoia Systems, Inc.  
3 Metropolitan Corporate Center  
Marlborough, MA 01752

Name \_\_\_\_\_  
Title \_\_\_\_\_ Company \_\_\_\_\_  
Type of business \_\_\_\_\_ Phone \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

INTRODUCING THE SEQUOIA SERIES 200



Tandem VLX, NonStop are trademarks of Tandem Computers, Inc. Stratus, XA2000 are registered trademarks of Stratus Computers, Inc. Unix and Unix System V are trademarks of Bell Labs. IBM is a registered trademark of the International Business Machines Corp. Pick is a trademark of the Pick Corp.

# SEQUOIA

# MICROCOMPUTING

## MICRO BITS

Douglas Barney

### Data be the day



**Disk Error.** When Microsoft announced Excel for the IBM PC recently, the firm provided preview

copies of the software for the press and analysts to load at their leisure. However, two of the disks were mislabeled, causing problems during the installation procedure. Fortunately, our crack staff of PC-literate editorialists quickly discovered the problem and was soon recaling away.

**Manzi at bat?** The long development time of Excel for the PC gave Microsoft plenty of time to develop unique advertising ideas. One scheme that was dumped had a forlorn batter about to walk back to the dug-out, with a banner headline that read, "1-2-3, You're Out!" The advertisement might have been designed to rattle Lotus Chief Executive Officer Jim Manzi, an avid baseball fan. But the ad was "a little too harsh," as someone at Microsoft put it.

**A benchmark-clearing brawl.** Microsoft's claims that Excel for the PC outperforms 1-2-3 may not sit well with some

*Continued on page 46*

## Concurrent DOS 386 fired up

Update runs multiple MS-DOS sessions on several serial terminals

BY ALAN J. RYAN  
CW STAFF

MONTEREY, Calif. — Digital Research, Inc. last week enhanced its Concurrent DOS 386 by announcing Release 2.0. The latest version, reportedly fully compatible with Microsoft Corp.'s MS-DOS 3.3, offers users the ability to run multiple MS-DOS sessions concurrently on multiple serial terminals.

With the increased functionality of the operating system, a

user can run multiple and concurrent MS-DOS simultaneously on the main console and up to two MS-DOS programs or concurrent programs on whatever serial terminals are attached, according to Dick Williams, president of Digital Research.

Slated for availability next month, the \$495 operating system is said to support IBM PC-DOS and MS-DOS Releases 1, 2 and 3 on all consoles. Applications that run on the latest version include Ashton-Tate's

Dbase III Plus, Lotus Development Corp.'s 1-2-3, Computer Associates International, Inc.'s Supercalc, Microrim, Inc.'s R:Base System V and Wordperfect from Wordperfect Corp.

Concurrent DOS 386 supports "terminate and stay-resident" programs such as Borland International's desktop utility program, Sidekick. Users can reportedly run up to 255 tasks simultaneously, a feature that provides growth capability as the user goes to faster and faster

processors, Williams said.

Concurrent DOS 386 is also said to support local-area network (LAN) versions of applications such as Dbase III Plus and Supercalc4 without the need for network hardware, which re-

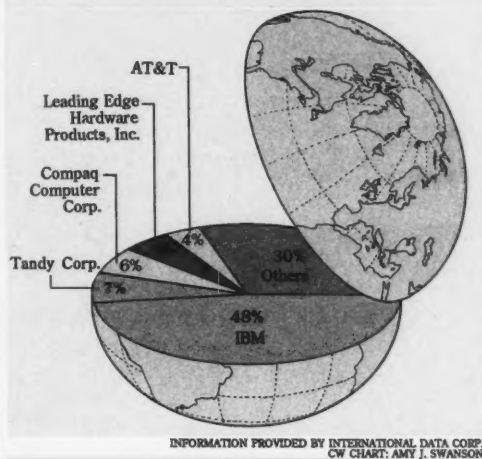
*Continued on page 40*

### Inside

- Profile: Compaq's Gary Stimac discusses his firm and the PS/2. Page 39.
- Users applaud Apple's Hypercard. Page 39.
- Softcraft programs provide Wordperfect users with desktop publishing ability. Page 47.

## Data View

PC shipments  
Share of worldwide market



## Excel groundwork bears third-party product fruit

NEW YORK — Prior to the recent announcement of an IBM Personal Computer version of its Excel, Microsoft Corp. worked closely with a number of third parties to develop products that extend Excel's capability.

The result is an impressive array of products, most of which center around connectivity between systems and take advantage of Dynamic Data Exchange, a Microsoft Windows facility for data sharing.

Micro Tempus, Inc. enhanced its Tempus-Access data link to let Microsoft Windows users import data from IBM mainframe computers without leaving the Windows environment. The upgrade reportedly will be available free of charge to Tempus-Access users in December.

DB/Access, Inc. demonstrated View/PC, which allows Excel users to import host data independent of the particular minicomputer or mainframe link.

Access Technology, Inc., maker of the 20/20 spreadsheet that runs on mainframes, minicomputers and micros, announced a facility by which 20/20 users on Digital Equipment Corp. VAX minicomputers and users of Excel can use the same models.

The firm also announced that it will enhance Excel for Apple Computer, Inc.'s Macintosh with two upgrades next year.

However, Microsoft still has a long way to go to catch up with the numerous add-on products that work with Lotus Development Corp.'s 1-2-3.

## IMS DB/DC on a PC? They said it couldn't be done. It's now available as an option for VS COBOL Workbench.

Create new IMS applications or maintain your old ones with the new IMS option for VS COBOL Workbench™ on your IBM PC/AT™ or PS/2™ and get all these benefits:

- Eliminate turn-around delays of IMS, DBD, PSB and MFS generations
- Instant response time
- Minimize SMF TSO/BTS job charges
- Prototype IMS applications easily
- Minimize IMS control region abends
- Put mainframe resources on your desktop

- Test IMS applications in a structured, responsive environment
- Compile, link, and test programs in minutes
- Use better and more responsive test facilities

### Look at these features:

- Full database call support
- GSAM
- CHECKPOINT/RESTART
- Secondary Indices
- Complete SSA processing
- All SSA Command Codes
- Adherence to DB positioning rules
- Conversational and non-conversational transactions

- Message switching
- Exact PCB feedback (Status Code, Key feedback and length, Segment Name and Level, etc.)
- MFS support for 3278 Models 2, 3 and 4
- /FOR and /EXIT commands
- Input/Output message queuing
- Dynamic cursor positioning
- Dynamic attribute modification
- Process limit count
- PCB status reporting
- DB/DC call tracing
- DB utilities

**For Huge IMS Programs**  
Our XM™ Memory Extender for PC-DOS and 32 bit compiler architecture make it possible to handle them on 80286/386 machines.

VS COBOL Workbench is a unique system of software tools for maintaining, creating, testing and running advanced COBOL programs on PCs. The IMS option greatly enhances its usability for mainframe programmers.

**For the most efficient development of either your PC or mainframe programs, call us now.**

**1-800-VS-COBOL**

U.S.: 2465 E. Bayshore Road  
Palo Alto, CA 94303  
(415)856 4161

U.K.: 26 West Street  
Newbury, Berkshire RG13 1JT  
(0635)32646

**MICRO FOCUS**  
A Better Way of Programming™

Micro Focus, A Better Way of Programming, XM and ANIMATOR are trademarks of Micro Focus Limited. VS COBOL Workbench is a registered trademark of Micro Focus Limited. PC/AT, PS/2 and OS/2 are trademarks of International Business Machines Corporation.

# Automated operations start with AutoMate/MVS™

Introducing automated operations to your data center may seem like an enormous task if you're unsure of where to start. Head in the right direction with **AutoMate/MVS**, the first automated operations product from Duquesne Systems. AutoMate/MVS is a full function, rule-based automation tool that solves many operation problems in today's complex MVS data centers.



Operators use their time more productively with the automated console tool—AutoMate/MVS

## **AutoMate/MVS™**

As the volume of online transaction processing increases, operations personnel face increasing amounts of low-level repetitive tasks and decision making. Service-level objectives become more difficult to meet, and the chance of human error increases dramatically. AutoMate/MVS relieves operators from these mundane, repetitive tasks and decreases the possibility of human error. The end result is increased productivity and system availability.

AutoMate/MVS has an extensive list of features which include:

- Rule-Based System for message management and time-driven automation
- Task Automation for automating complex events
- Extended MCS console capabilities for better system and console support
- Alternative Operator Interface for easy use and fewer operator errors

For years, data centers worldwide have benefited from system productivity software from Duquesne Systems. Our reputation as a leader in the area of operations has been built on providing quality products and support. Protecting data integrity, managing and allocating tape drives, consolidating consoles, and management and retrieval of SYSLOG in multiple CPU environments are our specialties.

Start automating your operations today with Duquesne Systems, the company that started operations productivity. For more information, call **(800) 323-2600**, or **(412) 323-2600** in Pennsylvania.



**DUQUESNE  
SYSTEMS**



SMALL  
TALK

William Zachmann

Time-sharing  
in spotlight

Generally, the copies that I receive of *Online Today*, the magazine sent to all CompuServe, Inc. subscribers,

get only a cursory reading. But the inclusion of CompuServe's "Fingershopping Catalog" in the October issue nailed me with admirable direct-mail efficiency.

While I've long used CompuServe, primarily to check the Official Airline Guide flight listings when planning my travel agenda, I've never had a proper manual for the service. So I decided to order some of the books on using CompuServe advertised in the magazine.

These included the *CompuServe Information Service Users Guide*, the *CompuServe Almanac and Advanced CompuServe for IBM PC Power Users*, by Charles Bowen and David Peyton. I ordered them on-line and, within a few days, found them in my post office box.

I thought I had a pretty good idea of the services that were available, having used CompuServe for some time. The menu system and various ways to get help on-line had given me what I thought was a pretty good acquaintance with the service. Just flipping through these three books, however, quickly showed me how much I'd been missing.

If you are an experienced user of CompuServe, you probably know more about it than I do. But if you have never used CompuServe, let me assure

*Continued on page 43*

Compaq's Stimac aims to protect MIS  
investment in PCs, calls bus wars a passive issue

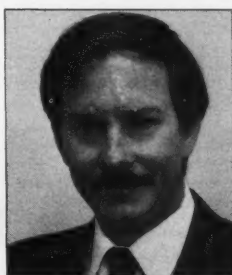
Gary Stimac, Compaq Computer Corp.'s vice-president of system engineering, spearheaded the development team that produced Compaq's impressive Deskpro 386/20 series, which was introduced last month. Being a consummate team player, however, he downplays his role in the project.

"We don't have people that work for anyone.

We have people that work with each other. We are a very team-oriented company," he says.

Stimac has been with Compaq from the start; it was the company's fifth employee. While there, Stimac has worked closely with Microsoft Corp. on versions of its MS-DOS and Basic for Compaq systems. In 1985, Stimac pulled together the engineering team that developed the Deskpro 286 and eventually the groundbreaking Deskpro 386.

Before joining Compaq, Stimac spent nine years with Texas



Gary Stimac compares IBM, Compaq architectures

Instruments, Inc., where he was involved in system development using Intel Corp. 8088 and Z80 technologies.

Stimac spoke with *Computerworld* Senior Editor Ed Scannell at the Deskpro 386/20's introduction in New York about a range of technological issues, most of which centered around the differences between Compaq

and IBM hardware architectures.

## What kind of engineering job did IBM do with the Personal System/2?

I think it is a reasonable engineering job. I think there are some esoteric benefits to the Micro Channel architecture, but do those benefits really deliver end-user benefits? Or is that the only way to deliver end-user benefits? The answer is no. There are other ways to deliver benefits, and that is why I would like to get out of the bus wars.

## With IBM having announced its Micro Channel, what is Compaq's selling point to large corporate accounts these days?

We protect the MIS investment in PCs and software today. And we can advance the performance of what we are delivering by providing more throughput. Compaq's purpose is to not get into

bus wars with respect to IBM. We feel the underlying architecture, be it Micro Channel or the Flex architecture that we have introduced, is a passive issue.

The actual architecture itself does not contribute to the overall performance of the system. There are different active components within the system — like the CPU, the memory, the disk subsystem, the different coprocessors. As long as that architecture does not limit the active components of the system, then those are the things that can contribute to the performance of the system.

## From an engineering standpoint, what advantage does the Deskpro 386/20 have over IBM's PS/2 Model 80?

The most important part of all CPU systems is to keep the CPU busy. About 90% of all operations are CPU- or memory-type

*Continued on page 46*

## Corporate users give Hypercard thumbs-up

BY JULIE PITTA  
CW STAFF

Just a month after its initial shipment, Apple Computer, Inc.'s Hypercard has found a mostly receptive audience with corporate users.

"It's a very addictive product," said Rick Richardson, national director of technology development for Arthur Young. "Once you get started with it, three hours go by in a flash."

Richardson said he recently used Hypercard as a presentation tool during a technology conference led by his department for other Arthur Young

staffers. The program presented a general outline on the main "stack." Richardson said he "clicked buttons" corresponding to specific portions of the outline to present more detailed information on those topics. A projection device for the Apple Macintosh let him show the information on a large screen.

When the conference adjourned, attendees received stacks for future reference.

Hypercard is also finding a home in financial applications. Jim Hayes, microcomputer manager for Seafirst Corp., a Seattle-based Bankamerica Corp. subsidiary, said his company is

## Hypercard

Price: \$49 for a currently owned Macintosh. Free with any Mac purchased since September.

- 1M byte of RAM
- Two 800K-byte floppy disk drives — hard disk is recommended for maximum performance
- Three disks and one backup
- On-line "help stack"

experimenting with Hypercard as a means of presenting financial reports to upper management.

Again, a general report would appear on the main stack. To re-

ceive more detail, a user would target a line, click a button and receive more detailed data regarding that particular item.

Hypercard's 1M-byte random-access memory (RAM) requirement could prove an obstacle to Seafirst's implementation of the product. The firm currently owns only two Macintoshes with Hypercard; about 99% of Seafirst's Macintoshes have only 512K bytes of RAM.

"We'll use it in isolated situations, not widely," Hayes said. "It'll probably be something we will use in the long run as we replace older machines with it."

*Continued on page 40*

## Accounting package makes sense for some

Users at small firms say Dac-Easy's price, ease of use appealing

BY ALAN J. RYAN  
CW STAFF

DALLAS — After reading an advertisement for a low-priced accounting software package two years ago, Chris Corpuz figured it would be worth a small investment to see how well it worked.

Corpuz, a manager at DeLoitte Haskins & Sells in Costa Mesa, Calif., said he has recommended the Dac-Easy Accounting package to at least a dozen of his clients since then.

Admittedly, the \$99.95 Dac Version 2.0 from Dac Software, Inc. is not for everyone. It was designed for smaller companies,

and some larger firms that have tried it have recorded unfavorable results.

One customer, who works in packaging in a \$500 million company, said he looked at Dac-Easy Accounting for off-line tracking of various accounting elements but found problems with the capacity.

"For us, it was something to play with and do a little tracking on, but not to track our whole accounting system," he said.

But according to Corpuz, "If a personal computer can fulfill your accounting needs, then there is a great likelihood that Dac can meet your needs."

The package comes with seven integrated modules: general ledger, accounts payable, accounts receivable, inventory, billing, purchase order and forecasting. For additional functionality, like job costing, Dac offers a separate payroll program, Dac-Easy Payroll, which integrates with Dac-Easy and sells for \$69.95.

## Test, one two three

Corpuz said that before recommending the package to anyone, he tested it with a standardized set of procedures he uses to check all new packages. The test included doing journal entries,

introducing reports to the program and creating errors and glitches to see how the program would respond.

"I keep a list of the top six or seven accounting packages in my mind," Corpuz said, "And [Dac] has stayed on the list for the past two years." He said the package offers no unique functions but that its pricing and ability to live up to its advertisements are somewhat unique.

Wyatt Smith, a safety engineer at LTV Aerospace and Defense Co. in Dallas, said he set up some users in his company with Dac-Easy Accounting. His initial purchase decision, he admitted, was based on the price of an early version of the package. "We got it in, and it was a little difficult at first to work with, but then Dac came out with en-

hancements," Smith said.

"I thought it worked very well," he added. "The only disadvantage to it is you have to have someone who likes working with computers to set up the system and maintain it."

Smith suggested, however, that users look before they leap into the Dac package. "The only problem I would see is that a new company or a small company thinking about a computer would probably have trouble jumping right in with it," Smith added.

Corpuz said when he has had trouble understanding the program, he has found the Dac support line to be helpful.

"One way to measure how well it works is customer satisfaction," Corpuz said. "I haven't had anybody who looked at it and said it wasn't good."

## Hypercard

FROM PAGE 39

Steven Morelli, general manager of financial planning and control for H. J. Heinz Co., said he is using Hypercard to compile product lists, with Hypercard stacks linking the master list to stacks containing more specific product information.

Hypercard has already become part of Morelli's daily routine. "I'm using Hypercard on a regular basis for things like phone lists, my calendar and a things-to-do list. I can be in Excel and return to Hypercard in exactly the location that I left it," he said, referring to Microsoft Corp.'s Excel program.

Morelli said his wish list would include the ability to take

data bases and load them into Hypercard, which would require Apple to release Hypercard code in the public domain, where it could be used by third-party developers. "It would give me a more powerful tool for updating data," he explained.

Not all have greeted Hypercard enthusiastically, however. "I'm not driven by any pressing need to use it," said Jeff Ehrlich,

manager of product technology for General Electric Co. "There are so many great off-the-shelf products, I don't know why anybody has to create anything with Hypercard."

Ehrlich conceded that Hypercard offers interesting possibilities. "You can do some pretty impressive things with it," he said. "But I have more fundamental problems to solve — of-

fice integration, getting Macintoshes and PCs working together, communications. You really have to sit down and program with Hypercard."

Apple has promoted Hypercard as a "personal tool kit" for the everyman, allowing the average user to create applications on the Mac. Since its introduction in August, the package has been bundled with every new Mac purchased. Current Mac owners can receive Hypercard for \$49. It requires at least 1M byte of RAM and two 800K-byte floppy disk drives.

### Promised too much?

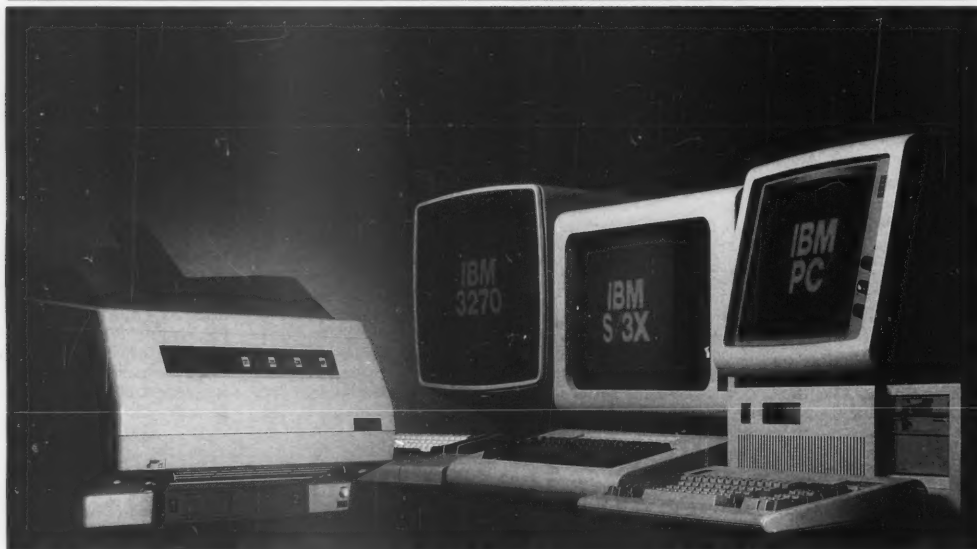
Industry experts said Apple may have promised too much with Hypercard. An average user trying to create applications using Hypercard will likely find himself in over his head, they said.

"Although many end users will tailor existing products to their liking using Hypercard, it doesn't necessarily mean that they have the skills to create a spreadsheet or a data base," said Bill Higgs, an industry analyst for Infocorp. "Experienced end users can create their own applications, but they'll have to know some of the principles of software programming."

Ehrlich likened Hypercard to a "next-generation Basic. It's about as hard as Basic," he explained. "You can get very elaborate with it."

However, Richardson said programming skills become unnecessary as third parties develop "stackware" to use with Hypercard. "I don't think most users are going to have to program," he maintained. "The more stacks that come out, the more people will build things with the stacks."

"I really don't think it was designed for everyone to program with," Richardson continued, noting that a programmer's guide is not included with Hypercard but must be requested.



## WE'RE TAKING ON THE WHOLE IBM WORLD. ONE PAGE AT A TIME.

No matter which corner of IBM's world you work in—3270, System/3X, or PC—the PageWriter high performance page printer will make it brighter.

Because it brings you the best of all worlds: stunning output, great economy, and true plug-compatibility. No outboard protocol converters. No extra cabling. No black boxes.

For PC users, the PageWriter Model 1080 offers Diablo 630 and Epson FX-80 emulation. And emulation is selectable from the front panel, eliminating clumsy

internal dip-switches.

The PageWriter Model 3080 is right at home in 3270 systems. It connects via standard coaxial cable to any Cluster Controller or a 4331 Display Adapter.

Model 5080, for System 34/36/38, uses standard twin-axial connectors, and emulates the IBM 5219.

Both the 3080 and 5080 PageWriters also have parallel interfaces built in, so they can share their time with PCs, too.

And when it comes to performance, the sky's the limit.

Near typeset-quality text at 8 pages a minute. A staggering 5000 page-per-month duty cycle—2000 pages higher than the so-called industry standard. Plus superb paper handling: 250-sheet input and output trays. With an optional second input hopper, the PageWriter can run through up to 500 pages completely unattended.

And while that kind of performance may seem earth-shattering, the PageWriter's operation is as near-silent as you can get.

So let a PageWriter make a world of difference to whatever IBM you live with. To find your nearest Datasouth distributor, call us at 800-222-4528.

  
**Datasouth**  
AMERICA'S HIGH PERFORMANCE  
PRINTER COMPANY

P.O. Box 240947, Charlotte, NC 28224 • (704) 523-8500 • Tlx: 6843018, DASO UWW • Sales: 1-800-222-4528 • Service: 1-800-438-5050 • West Coast Office: (415) 940-9828

IBM is a registered trademark of International Business Machines Corporation.

## DOS 386

FROM PAGE 37

sults in lower cost to the user, Williams added.

"For a typical configuration, the cost to the user could be less than half in a multiuser configuration rather than a LAN implementation," he said. "The user is able to use a single 386 as the main processor and then low-cost serial terminals, as opposed to PCs, as individual terminals." A second benefit, he added, is greater ease in configuration.

The DOS compatibility of Concurrent DOS XM Release 6.0, which takes advantage of extended memory, has also been extended to the DOS 3.3 level and reportedly will run well-behaved DOS applications on serial terminals. Concurrent DOS XM costs \$395.



## OUR SOFTWARE IS PREFERRED BY AN ELITE CIRCLE.

This world has many companies whose products are marketed across borders. But only one whose software crosses borders—in two important respects.

First, our technology.

Several years ago, McCormack & Dodge pioneered a technique of integration which allowed users to move effortlessly from one application to the next while pursuing a

path of inquiry. In effect, this development erased the borders between packages and created a single informational environment for corporate decision-making.

Second—and even more important than our celebrated borderless technology—is the McCormack & Dodge approach to multinational service and support. Truly borderless in the classic geographic sense.

We have professionals in over 40 countries. We offer systems and documentation in multiple languages. We design our systems to accommodate the myriad laws and business practices found throughout the world. And to run in several different hardware environments.

In the world of McCormack & Dodge, knowledge has no borders.

### McCormack & Dodge

**DB** a company of  
The Dun & Bradstreet Corporation



## WITHOUT DATA GENERAL, INTEGRATING YOUR COMPUTERS IS LIKE PITTING MAN AGAINST MACHINE.

### DATA GENERAL GIVES YOU THE BEST SOLUTIONS FOR COMPUTER INTEGRATED MANUFACTURING SYSTEMS.

Are the levels of your manufacturing operation locked in hand to hand combat? Our total integration solutions can make them all work together. Hand in hand.

The full range of our computers and solutions spans key areas. So engineering can tie in with manufacturing. Planning and control can communicate with sales and administration.

We give you advanced productivity solutions. With TEO™ our technical automation system. And with CEO® our business automation system. Each further streamlines your operations when they're combined with major CIM applications.


Data General is firmly committed to industry communications standards. Like MAP SNA, X.25 and Ethernet®. They give you even more flexibility. And help you forge different systems into a single information mainstream.

What's more, our MV/Family computers are price/performance leaders. Which makes these solutions more affordable.

Our global support team can mold manufacturing solutions to fit almost any need. Whether it be production of steam turbines. Or manufacturing paper products. Companies wrestling with today's complex manufacturing needs have discovered integrated solutions from Data General.

To find out more, call 1-800-DATAGEN (in Canada call 1-800-268-5454). Or write: Data General, 4400 Computer Drive, MS C-228, Westboro, MA 01580.



 **Data General**  
a Generation ahead.

© 1986 Data General Corporation. TEO is a trademark and CEO is a registered trademark of Data General Corporation. Ethernet is a registered trademark of Xerox Corp.



## Time-sharing

FROM PAGE 39

you that you are missing out on one of the most exciting aspects of the personal computer revolution.

Growing out of the world of remote computing services, or time-sharing, CompuServe shifted first toward providing on-line data bases and, more recently, to creating an incredibly versatile electronic communications system. More than any other contemporary institution, CompuServe embodies the exciting direction in which electronic information technology is inevitably taking us.

Connecting with CompuServe is easily done with any PC equipped with a modem and communications software. Local dial numbers are available in virtually all North American cities of any size.

Logging in is simply a matter of entering your user ID number and password. From that point on, it is quite easy to navigate through CompuServe by means of the hierarchical menu system. You can check recent news stories, obtain market quotes, consult reference material, check movie reviews, airline schedules and fares, obtain weather reports and garner lots of other information.

The *CompuServe Almanac*, which lists all the data bases and services, is more than 200 pages long and typically lists four or five unique services on each page. New services are constantly being added.

### Worldwide link

The real power of the services that CompuServe provides is not simply in providing on-line access to information of various sorts, however useful that may be. Rather, it is in providing a sophisticated, electronic medium that enables individuals all over the world to communicate with one another about topics of interest to them.

CompuServe's Easyplex electronic mail facility is only part of this. You can look up other subscribers in the directory and send them E-mail messages. There is also an on-line real-time capability for two or more individuals to communicate with each other.

But the most important fa-

cility that CompuServe provides is the combination of these and other capabilities into the CompuServe forum. These are uniquely organized electronic "neighborhoods" in which people with common interests can get together to share ideas and information.

There are three basic types of forums on CompuServe:

- Computer forums are focused

on types of computers, particular programming languages, software products and so forth.

- Professional forums are organized around particular professional interests like law, architecture or medicine.

- General-interest forums cover everything from gourmet cooking to religion, music, health, politics and humor.

Within a forum, you can

leave messages for others on an electronic message board, read messages left by others, engage in on-line conferences (usually scheduled at specified times) or access the forum's data library.

Until you've worked with one or more CompuServe forums, it is hard to appreciate how useful they can be.

The computer forums, for example, are probably one of the

best ways to learn about new hardware and software, what works and what doesn't, what problems other users are having and how they are solving them. Information center managers, for one, will find the computer forums to be an invaluable resource.

Zachmann is vice-president of research at International Data Corp.



Sit back and relax. Because whether you're in financial or information services, manufacturing or transportation, AT&T can offer you a wide range of first class transmission services domestically and internationally.

Our cable and satellite services can handle bulk data processing and on-line interactive applications, at high or low speeds. So we can tailor our services to meet your particular needs.

And, once you've chosen an AT&T telecommunications service, you can rest easy. Because AT&T provides you with not only high quality transmission, but the support of our 15

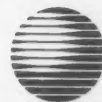
international offices. And the benefits of our long-standing relationships with foreign PTTs.

So, no matter how much you need to send, or how often you need to communicate overseas, there's one thing you can count on.

**AT&T comes through.**

Call now to find out how: **1 800 448-8600 Ext. 955**. Our Sales Representatives will be delighted to tell you how we can cater to your every telecommunications need.

**From equipment to net-working, from computers to communications, AT&T is the right choice.**



**AT&T**

The right choice.

### VM/CMS USERS

Developing Applications?

Use XMENU/II for

Total Full-Screen Support.

- Powerful REXX interface
- Fast screen pointer
- High-level language support
- Extensive validity checking
- Complete 3270 support

Call Now: 408/980-9414

Kollin Corporation

3064 Scott Blvd., Santa Clara CA 95054



**F**or decades the 16-foot barrier stood unchallenged. In 1962 the record was finally broken. It now stands at over 19 feet. The athletes didn't make the difference. The technology did. The fiberglass pole had been introduced to the sport of pole vaulting. Technology enhances performance.

**ADR PERFORMANCE SOFTWARE. TECHNOLOGY THAT PUSHES PERFORMANCE TO NEW HEIGHTS.**

For nearly 30 years, ADR has been helping business get more from its people and computers. ROSCOE<sup>®</sup> increases productivity of programmers working on-line. The LIBRARIAN<sup>®</sup> reduces the time spent maintaining programs. IDEAL dramatically boosts productivity by streamlining the programming process. DATACOM/DB<sup>®</sup> brings relational flexibility to a production environment. And ADR is delivering new technologies like the MINDOVER MVS<sup>™</sup> expert system and CASE. All with one goal—to enhance performance. So if your goal is greater productivity, change your technology. To ADR Performance Software. To learn more call 1-800-ADR-WARE.

**ADR PERFORMANCE SOFTWARE.**  
Unlock the potential.

## Stimac

FROM PAGE 39

operations, so the best thing you can do is to have zero-wait state operation for your CPU. [With Compaq's Flex architecture], the CPU can operate out of the cache memory 95% of the time, and only 5% of the time does it need to go to main memory.

IBM's systems work on a one-wait state approach. There are an additional two cycles, with the 16- and 20-MHz cycles, where they typically have to wait for the accessing. So are they maximizing their CPU bandwidth? The answer is no. Only a cache-type architecture allows that in a cost-effective manner.

**Corporate accounts want micro-to-mainframe connection. And with the PS/2's ability to support multiple masters, they can slap in an IBM 370 on a chip. What are Compaq's options here?**

We could look at something like the [IBM Personal Computer] AT/370 or the 3270 Personal Computers, which were built on the AT architecture. We can take a look at the coprocessors in general. If you take a look at most of the peripheral cards, communications cards [and] 3270 cards, almost every local-area network card has a separate coprocessor on there that is handling the low-level protocols. So we are not lacking for coprocessor systems.

## Data

FROM PAGE 37

row-and-column wizards at Lotus. Some 1-2-3 insiders have benchmark-tested Lotus's spreadsheet against a late beta-test, or preview, version of Excel and are itching to claim victory. Company officials, however, have no plans to release such benchmark results to the public. But maybe if you ask them off the record?

**Can I get a 370 this way?**

Just \$3,349.95, four to eight hours of work and a screwdriver is all it takes to get an Intel 80386-based micro, kit and kaboodle — at least according to Heath/Zenith Consumer Products Group in St. Joseph, Mich.

The firm, which offers a variety of build-it-yourself kits, is offering a system identical to the 80386 machine currently offered by Zenith Data Systems. The only difference is that the Zenith Data Systems version costs more and comes assembled. Heath/Zenith is also considering offering a kit version of its Tension Mask Display monitor and may introduce a 386 lap-top kit sometime next year. Any of you tinkers want to

**What sense does it make to have a dual-bus containing the Micro Channel?**

We believe that any type of architecture that has Micro Channel and industry-standard [architectures] is probably the worst of both worlds. You don't really have the flexibility that you would like to have. You are forced to buy either a Micro Channel card or an industry card, or you have to have a power supply or space large enough to satisfy both requirements. So Compaq doesn't believe that is a reasonable architecture. Plus the micro-level timing is very difficult.

**What are the multitasking solutions available to Compaq besides IBM and Microsoft's OS/2?**

I think Unix offers certain alternatives. But again, [we don't want] to get into operating systems wars. One needs to decide on an operating system based on the applications one wants to develop around a PC.

If they want a multiuser-type system, there is Xenix. There are Unix solutions available, and those may do a better job than networking PCs together. If someone wants to run existing applications, the best that is available today is Windows/386. As new OS/2 applications come out, one will have to evaluate those new applications against today's existing applications.

**What are the company's options for exploring a**

take on Compaq?

**Win-Win.** A recent report from Sanford C. Bernstein & Co. describes IBM as being "back in a leadership role" with the introduction of the Personal System/2 line. But this role is not hurting Compaq and a handful of other PC cloners, which will continue to experience strong growth, according to Bernstein. Maybe there is room in this town for the two of them.

**Companies invent the darnedest things.** Crorerearch in Lyons, Colo., has an answer to those sticky Write/Protect tabs.

For \$1.69, users can buy Disky, a device that slides into a floppy disk drive above the disk and serves as a temporary Write/Protect tab without the adhesive. Best of all, you only need one per PC.

**OS/2: Who needs it?** To Microsoft's apparent consternation, Lotus insiders report that their firm is positioning 1-2-3 Release 3.0, coupled with the Lotus/Intel/Microsoft Expanded Memory Specification Version 4.0, as a fine alternative to an OS/2 version of 1-2-3.

**Leading edge, sort of. Man-**

**communications strategy?**

There are a number of options. We differ in our philosophy a little bit from IBM with respect to how we see PCs connected to mainframes. We do believe some PCs will be connected to mainframes. We don't believe that every individual PC needs to be running OS/2 Extended Edition and have 4M to 6M bytes of memory on it. We believe that a more economical solution, a better work group solution, is to tie those individual PCs together into a network and use the network as a gateway to actually satisfy the host that is transferring data.

IBM's strategy is to sell their mainframes and minicomputers, and the type of architecture they are promoting will absolutely promote more sales of their host systems.

**With all its power, will a machine based on Intel Corp.'s 80386 continue to be a personal computer?**

I think it has some dual capabilities. It isn't just a single platform that is used for productivity. It is also an excellent platform for file servers and for computer-aided design. What we will also see are new applications around OS/2 and Unix that will further exploit the 386. It has taken almost a year for the people to recognize the power of it and be able to exploit it. I think you will see artificial intelligence applications moving down to the 386 as a delivery mechanism under \$10,000.

ufacturers Hanover Vice-President Arthur Block says his firm is quickly moving to the next generation of hardware and software. But for Block, the next generation consists of 386 machines and the Microsoft Windows-based Excel. The firm will move to OS/2s "in a few years," Block says.

**There's more to it.** A *Computerworld* report on the long-awaited textual data base and personal information manager that Lotus founder Mitchell D. Kapor worked on drew reaction from some Lotus workers. Although many Lotus sources refer to the package as the "Mitch Product," that's not the whole story.

According to the Cambridge, Mass., spreadsheet colossus, it was Ed Belove, Lotus's vice-president of research and development, who wrote most of the code for the product that will touch down at Comdex/Fall '87 next month.

And let's not forget Jerrold Kaplan, former Lotus chief technologist, who provided much more than just the artificial intelligence know-how.

Barney is a *Computerworld* senior editor, microcomputers.

# Free Informix seminar

As you may know, the Informix® line of SQL-based RDBMS products gives you full portability across VMS®, UNIX®, MS™DOS and networked systems.

But for the full story, come to our free half-day Informix product seminar in any one of the cities listed below.

To RSVP—and to find out details—please call (415) 322-4100.

Cities	Dates
Atlanta	10/14
Baltimore	10/14
Boston	8/3, 9/14, 10/28, 11/18
Chicago	8/12, 9/15, 10/14, 11/9, 12/8
Dallas	10/20
Denver	10/16
Detroit	9/16, 10/15, 11/10, 12/9
Hartford, CT	10/6
Houston	11/6
Indianapolis	11/5
Los Angeles	8/3, 9/14, 10/28, 11/18, 12/8
Menlo Park, CA	11/5
Memphis	10/22
Minneapolis/St. Paul	10/29
New Orleans	10/14
New York City	8/5, 9/16, 10/14, 11/18
North Jersey (Woodbridge)	8/19, 11/5, 12/2
Philadelphia	10/6
Phoenix	11/4
Pittsburgh	10/8
Portland	10/6
Raleigh, NC	10/27
Salt Lake City	10/15
San Francisco	8/5, 9/16, 10/14, 11/18
Seattle	8/7, 9/9, 10/7, 11/5, 12/2
St. Louis	10/20
Tampa	10/7
Washington, D.C.	8/7, 9/9, 10/7, 11/5, 12/2
<b>Canada</b>	
Montreal	10/19
Ottawa	10/20
Toronto	8/19, 11/5, 12/2
Vancouver	10/8
<b>International</b>	
Bonn	10/16
Frankfurt	10/15
London	10/13, 11/13, 12/3
Munich	10/6, 11/9, 12/1
Paris	10/8, 11/11, 12/2



The RDBMS for people who know better.

Informix is a registered trademark of Informix Software, Inc. Other names indicated by TM are trademarks of their respective manufacturers. © 1987 Informix Software, Inc.



## NEW PRODUCTS

## Systems

A system for capturing guard-tour data for immediate analysis at completion of tour has been introduced by **Sector Technology**.

The **Guard Tour Management** system consists of software for IBM Personal Computer AT compatibles, credit card-size microcomputers for reading bar code labels at checkpoints and bar code labels. The system supports the recording of such incidents as open safe, classified document not stored, door open and hazardous material spill.

The complete guard tour can be printed out, and statistical analyses of time variance and recorded incidents by guard can be performed.

Guard Tour Management software costs \$1,400 plus \$300 for each wand and recharging unit and 24 cents for each bar code label.

Sector Technology, Suite 444, 6 Skyline Place, 5109 Leesburg Pike, Falls Church, Va. 22041. 703-379-1800.

A 66M-byte Intel Corp. 80386-based system available in 16- and 20-MHz versions has been announced by **Advanced Logic Research, Inc.**

The system, called **386/2 Model R66**, accepts either an 80287 or 80387 coprocessor on the system board. Standard memory is 1M byte of 32-bit random-access memory expandable to 2M bytes on the system board without add-on memory cards. Other features include one serial and one parallel port, 1.2M-byte 5¼-in. floppy disk drive and eight expansion slots.

The 386/2 Model R66 costs \$3,490.

Advanced Logic Research, 10 Chrysler, Irvine, Calif. 92718. 714-581-6770.

## Software applications packages

**Accel Technologies, Inc.** has added **Tango-Schematic**, a schematic capture

package, to its Tango line of computer-aided design and engineering software products.

Tango-Schematic is said to provide a front end to Accel's Tango-PCB and Tango-Route circuit-board design systems. Included are such graphics editing features as four line types, four text sizes and rubberbanding of wires and buses.

Other features include one-step commands to move, rotate and scale text and components; a built-in documentation editor; more than 3,100 library parts; block functions; and five-level zoom capability.

Tango-Schematic runs on IBM Personal Computers. It is priced at \$495.

Accel Technologies, 7358 Trade St., San Diego, Calif. 92121. 619-695-2000.

Two programs from **Softcraft, Inc.** are said to provide users of Wordperfect Corp.'s Wordperfect with laser or dot matrix printers with desktop publishing capabilities.

**Laser Fonts** and **Fancy Fonts** for Wordperfect use Wordperfect's formatting features to produce unlimited headline and text styles and sizes. Laser Fonts, which can be used on Hewlett-Packard Co. Laserjet Plus, Series II and compatible laser printers, downloads fonts and automatically makes printer definition files for Wordperfect.

Fancy Fonts for Wordperfect, which can be used for Epson America, Inc.'s FX and compatible printers, is said to achieve near-laser quality printed output.

Laser Fonts costs \$180. Fancy Fonts for Wordperfect costs \$210.

Softcraft, Suite 500, 16 N. Carroll St., Madison, Wis. 53703. 608-257-3300.

The accounts receivable module of the **Businessworks PC** business accounting package has been introduced by **Manzanita Software Systems**.

The accounts receivable system is said to be capable of handling an unlimited number of customers, tracking such items as monthly and year-to-date sales and adjustments, highest balance, credit limit and open credits. It can produce invoices and statements on preprinted forms or plain paper and can automatically generate recurring invoices. It also includes the ability to export financial information and reports.

Each module in the Businessworks PC program costs \$395. The System Manager costs \$95.

Manzanita Software Systems, Suite 200-A, One Sierragata Plaza, Roseville, Calif. 95678. 916-781-3880.

## Software utilities

A source-level Dbase debugger has been announced by **HJS Research, Inc.**

Designed for use with Ashton-Tate's Dbase III+ and Foxbase V.20, the debugger, called **Dbug**, is said to allow users to enter break points that permit the program to execute until the break point is encountered. Break points may be entered at any location in the code.

Other features include watch points and trace points.

Dbug uses multiple windows, hot keys and more than 30 debugging commands. Access to Dbase commands and functions is supported.

Dbug costs \$195.

HJS Research, Suite 6162, Cedar Court, Monmouth Junction, N.J. 08852. 800-323-1809.

# The problem with most 4GLs is they're finished before you are.

And where does that leave you?

With the final, tricky ten percent of your application yet to write, and no 4GL left to write it with. Sound familiar?

If so, try **INFORMIX-4GL**.

Never again will you have to switch to C or COBOL to truly customize your application. Instead, **INFORMIX-4GL** provides an all encompassing syntax for every aspect of your application building.

So once you're programming in **INFORMIX-4GL**, you never have to leave it. And considering all it can do, you may never want to.

Now, for instance, you can write in just ten to twenty pages of 4GL code, applica-

tions that would take hundreds of pages with C.

That's because **INFORMIX-4GL** was designed from the start to be an application building language. It's built around the full implementation of ANSI Standard SQL. And features Custom Screen Generation, Custom Menu Building, a built-in Report Writer and Windows.

What's more, **INFORMIX-4GL** works with UNIX, VMS, MS-DOS and Networked DOS operating systems. And, of course, it's compatible with **INFORMIX-SQL**—our popular, proven DBMS. So files you build with one, you can access with the other.

For more information and our free booklet, "A 20-Minute Guide to **INFORMIX-4GL**," call 415/322-4100.

Or write Informix Software, 4100 Bohannon Drive, Menlo Park, CA 94025.

And start taking your applications to even greater heights.



## INFORMIX

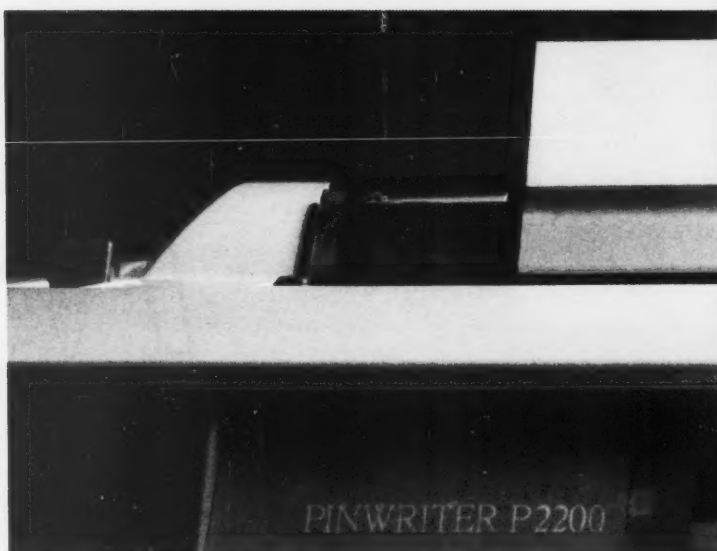
The RDBMS for people who know better.™

INFORMIX is a registered trademark of Informix Software, Inc. Other names identified by TM are trademarks and/or trademarks of their respective manufacturers. © 1987, Informix Software, Inc.

# IF THE REASON YOU A 24-PIN PRINTER YOU'VE JUST LOST

You've also lost your last reason for buying a 9-pin printer. Our new Pinwriter® P2200 dot matrix printer is the first 24-pin printer that is priced lower than many of today's 9-pin printers.

However, we didn't strip the price by doing the same thing to features. In fact, we gave the P2200 a few features you won't find on any other printers at any price.



9-pin printer

24-pin printer

Like more software support than any other 24-pin printer and unrivaled paper-handling capabilities. It feeds from both the rear and the front. And you can print a single sheet without removing your continuous paper. You can also produce up to 128 type variations within a single document.

# HAVEN'T BOUGHT IS PRICE, YOUR REASON.

AVAILABLE FOR UNDER \$500.

We also didn't get the price down at the expense of speed. The P2200 prints 55 cps in LQ mode—that's faster than any other printer in its price range. And in draft mode, it speeds along at 170 cps.

So see your  
thing else  
would be  
thoroughly  
unreasonable.



NEC dealer today. Any-

**NEC PRINTERS. THEY ONLY STOP  
WHEN YOU WANT THEM TO.**

# NEC

For more information and the name of the NECIS dealer nearest you, call 1-800-343-4418 (in MA 617-264-8635). Or write: NEC Information Systems, Dept. 1610, 1414 Massachusetts Ave., Boxborough, MA 01719.

A macro package for use with Microsoft Corp.'s Works on the Apple Computer, Inc. Macintosh has been announced by **Lundeen & Associates**.

The software, called **Workplus Command**, can be installed directly onto the Microsoft Works disk. It adds such features as the ability to print multicolumn labels and generate tables of contents and indexes for word processing documents. It will also perform global search-and-replace in data base and spreadsheet documents.

Command includes a programming language for extending and customizing Works. It allows access to all Works documents and comes with more than 100 built-in functions.

Workplus Command costs \$99.95. Lundeen & Associates, P.O. Box 30038, Oakland, Calif. 94604. 415-893-7587.

### Development tools

A version of the U.S. Department of Defense validated Ada development system designed to run on the standard IBM Personal Computer has been announced by **Meridian Software Systems, Inc.**

**Advantage 2.0** is said to compile more than 1,000 line/min. It includes such Ada features as tasking, exceptions, generics and separate compilation.

According to the vendor, the Ada compiler is portable across different system architectures. It is accompanied by a set of support tools designed to manage an Ada program library data base.

Advantage 2.0 costs \$795. Meridian, Suite 105, 23141 Verdugo Drive, Laguna Hills, Calif. 92653. 714-380-9800.

The **Advanced Development Toolkit**, a collection of software tools for customizing the DAP 1200 series of Data Acquisition Processors, has been announced by **Microstar Laboratories**.

According to the vendor, C programs developed with the tool kit can be installed by the multitasking operating system of the DAP 1200. The tool kit provides access to on-board resources such as timers and output ports.

Also announced were two digital versions of DAP 1200 boards, the **1200/2D** and the **1200/4D**.

The Advanced Development Toolkit costs \$200. It requires the Microsoft Corp. C compiler Version 3.0 or higher. The DAP 1200/2D and the DAP 1200/4D cost \$995 and \$1,195, respectively.

Microstar, 2863 152nd Ave. N.E., Redmond, Wash. 98052. 206-881-4286.

### Software enhancements

An enhanced version of the **Venix System V** Unix operating system for person-

al computers has been announced by **Venturcom, Inc.**

Release 2.3 features real-time extensions, adherence to AT&T standards, support for the IBM Enhanced Graphics Adapter (EGA) board, AT&T binary compatibility and developer's tools.

Performance enhancements include improved memory management to minimize I/O, a more efficiently coded kernel, a larger 1,024-byte file system and an extended buffer cache.

The full Venix 2.3 system costs \$990. Venturcom, 215 First St., Cambridge, Mass. 02142. 617-661-1230.

### Data storage

A removable-cartridge Winchester disk

drive featuring a formatted capacity of 44.5M bytes has been announced by **Syquest Technology**.

The **SQ555** offers an average access time of 25 msec and a sequential data transfer rate of 600K byte/sec. Features include an embedded small computer system interface, an 8K-byte buffer, error correction control and automatic retry and self-diagnostics.

The SQ555 drive costs \$995; the cartridge costs \$100.

Syquest, 47923 Warm Springs Blvd., Fremont, Calif. 94539. 415-490-7511.

**National Memory Systems Corp.** has enhanced its **ER-9000** series of tape backup products for IBM's AIX operating system and RT Personal Computer.

The series offers AIX 2.1.1 compatibility, 1,600 bit/in., 3,200 bit/in. and 6,250 bit/sec. options. According to the vendor, the product can run under Unix's CPIO, back up and restore commands and provide ASCII file conversion capabilities.

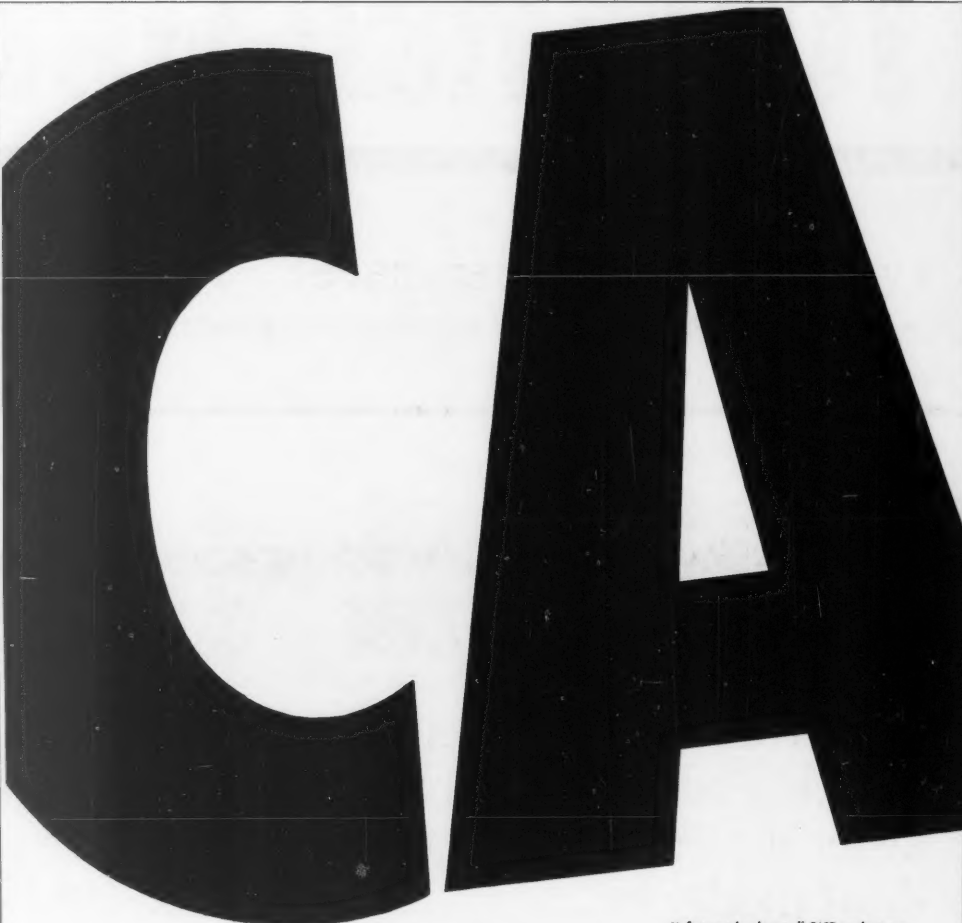
The 1,600 bit/in. ER-9000 series costs \$5,000.

National Memory, 30 Lindbergh Ave., Livermore, Calif. 94550. 415-443-1669.

### Printers/Plotters/Peripherals

Two monochrome graphics terminals featuring Tektronix, Inc. 4010 and 4014 emulation have been announced by **Rebus Corp.**

Both the **Rebus Orange AG** and the



## A Technology This Big Simply Can't Be Contained on a PC.

Computer-Aided Software Engineering. More commonly known as CASE. It's a software technology whose time has come. With CASE, you can work faster and more efficiently in the design, analysis, implementation, and maintenance cycles of software development.

Clearly, a technology this big demands more than a PC. CASE belongs on a mainframe. Because only a mainframe can provide you with the capacity to undertake large development projects. And only a mainframe will allow you to easily share data among all developers, thereby unifying development efforts.

Unfortunately, almost all CASE products are PC-based. Until now.

### Introducing CasePac: The First CASE Product Specifically Designed for the DB2 Environment.

By residing in the DB2 environment, CasePac provides you with the processing power, distributed development features, and data sharing capabilities that you just can't find with PC-based CASE products.

With CasePac, all your developers build upon one set of development data, and work with one

**PROMPT**

DBMS

FOR THE

IBM SERIES/1

800-626-5518

502-633-5700

EDI & APPLICATIONS TOO!





A Rebus graphics terminal

Rebus Orange AGB offer drawing speeds up to 2M pixel/sec. The AG offers 1,024- by 391-pixel resolution, and the

AGB features a selectable-interlace mode for displays of 1,024 by 391 or 1,024 by 768 pixels.

The Rebus Orange AG costs \$595; the AGB costs \$695.

Rebus, P.O. Box 36503, San Jose, Calif. 95158. 800-426-7090.

The **Laserimage 1000** 6 page/min printer featuring 31 standard fonts has been introduced by **Personal Computer Products, Inc.**

The printer offers RS-232 serial, Centronics parallel and RS-422 interfaces. It emulates the Hewlett-Packard Co. Laserjet Plus, HP Laserjet Series II, IBM Proprinter, Diablo Systems, Inc. Diablo 630 and Epson America, Inc. FX-80 printers. The Laserimage 1000 also has an optional

pop-in cartridge providing HP 7475A plotter emulation.

A 150-sheet paper tray is standard, and an optional 250-sheet tray is available. Resolution is 300 dot/in. Standard memory is 1M byte, expandable to 2M bytes.

The Laserimage 1000 costs \$2,495.

Personal Computer Products, Suite 100, 11590 W. Bernardo Court, San Diego, Calif. 92127. 619-487-5809.

The **Mac & Touch Screen**, an integrated touch-screen system for the Apple Computer, Inc. Macintosh personal computer, has been announced by **Microtouch Systems, Inc.**

According to the vendor, the all-glass touch screen features a mouse-compati-

ble software driver that allows all Macintosh software, including Apple's Hypercard, to work with the screen without modification.

The screen is based on a patented analog capacitive sensing technology. It offers a resolution of 1,024 by 1,024 touch points.

The Mac & Touch system is priced at \$995.

Microtouch Systems, 10 State St., Woburn, Mass. 01801. 617-935-0080.

## Board-level devices

The **Multivid 16L**, a graphics board for use with such graphics applications as Autodesk, Inc.'s Autocad, has been introduced by **Dolen Computer Corp.**

Part of the Multivid product line, the add-in card features an automatic switch to IBM Enhanced Graphics Adapter or Color Graphics Adapter video display mode when used with variable-rate scanning monitors.

Multivid boards are priced from \$699 to \$2,895.

Dolen, 18 Knight St., Norwalk, Conn. 06851. 203-855-0895.

An analog and digital interface card designed for the Apple Computer, Inc. Apple II, II+ and IIE has been announced by **Naylor Industries**.

The card, called the **Data I/O 8**, provides eight channels of analog inputs and eight channels of analog outputs as well as 24 digital input bits and 24 latched digital output bits.

According to the vendor, it allows the Apple computer to make electrical measurements, send and receive control signals and generate wave forms for industrial, scientific and educational applications.

Data I/O 8 is programmable in Basic or assembler and may be installed in slots one through seven.

Data I/O 8 costs \$295, including a manual and cables.

Naylor, P.O. Box 33187, Indianapolis, Ind. 46203. 317-783-6049.



CASE tool. No matter how large the project. No matter how distributed the development efforts.

## CasePac. A Comprehensive CASE Facility Combined with an Integrated DB2 Data Dictionary.

The CasePac data dictionary acts as a central repository for all your development information, from design through maintenance. No matter how large your project, the power of the CasePac data dictionary enables all your developers to work with, and build upon, the same set of integrated lifecycle information. So the software objectives you initially establish are maintained throughout the development process.

## CasePac. Automated Software Development and Integrated Data Dictionary for DB2.

IBM and DB2 are registered trademarks of International Business Machines.

## Extensive Graphics, Modeling, and Analysis Capabilities. And More.

The graphics, data modeling, analysis, extensibility, DB2 design, and maintenance features of CasePac make it a valuable tool for all cycles of software development.

What's more, CasePac provides comprehensive data base administrative functions such as defining DB2, IMS, and flat file structures.

And with CasePac, you gain immediate access to both on-line and hard copy documentation, which is generated automatically.

## Up and Running Immediately. Free 30-Day Trial.

You'll benefit from CasePac's capabilities right

away, because CasePac reads COBOL programs and libraries, IMS libraries, and the DB2 catalog to populate the dictionary from existing applications.

For a free, 30-day trial of this remarkable product, call or write: On-Line Software International, Inc. Two Executive Drive, Fort Lee, NJ 07024. OEM, VAR and Service Bureau programs are also available. Look for CasePac product seminars offered in your area—call for dates and locations.

So if you're serious about using CASE technology in your software development process, use the first CASE product that has the mainframe power and capacity you need. CasePac.

800-642-0177

In Canada: 416-671-2272/In Europe: 44-1-631-3696



On-Line Software International  
Authorities in IBM® Software



CasePac is a joint venture with  
Data Consultancy Services.

## GENERATE PROGRAMS 6 TIMES FASTER.



## Introducing GENESIS V. The First Fifth Generation S/38 Application Generator.

Create complex programs in days, simple ones in minutes. GENESIS V learns and uses your standards when it generates. Lets you add and change generated RPG III and DOS source code, and later you can still use GENESIS V to add or change screens, files, and fields. Introductory price \$14,950.

Call toll-free for your free concept guide:  
1-800-326-3000, ext. 125.

**HELP/38**

210 Baker Technology Plaza  
6011 Baker Road, Minnetonka, MN 55345  
612/933-0609 Telex: 290184  
In Europe call Suifone 061/943-1241



## With some 4GLs, training users can be a real challenge.

**W**ith FOCUS, users can have real success. Fast.

FOCUS is the ultimate in fourth-generation technology. It is designed to let users do useful work immediately.

For example, there is a window-driven point-and-pick interface that lets beginners generate a report or graph, make inquiries—even create an entire application—without learning any syntax. In fact, the system displays the syntax so the user can learn the language while creating the application.

### Lots of Help for Users

Your programmers can create extremely easy-to-use, window-driven applications using FOCUS. Or casual users can help themselves to information through the English Query Language (EQL)—the self-explaining natural-language interface to PC/FOCUS®.

For anyone who wants to learn the FOCUS fourth-generation language, complete, professionally developed learning resources are available. Just take a look at the box to the right.

### Other Environments

FOCUS runs in IBM's 370, PC and PS environments, on the DEC VAX, under Wang VS, and under UNIX. Learn FOCUS in any one of these environments and you can write an application in any other, and it will run in all of them.

### Most Widely Used

Around the globe, more than 4000 sites have FOCUS installed, making it the most widely used fourth-generation language in the world. And we've been involved in training at every site.

FOCUS has a large and independent user group. And Information Builders backs FOCUS with the support you'd expect from an industry leader: local help lines in 12 regional offices, a central hotline, and a national network of technical support and training centers.

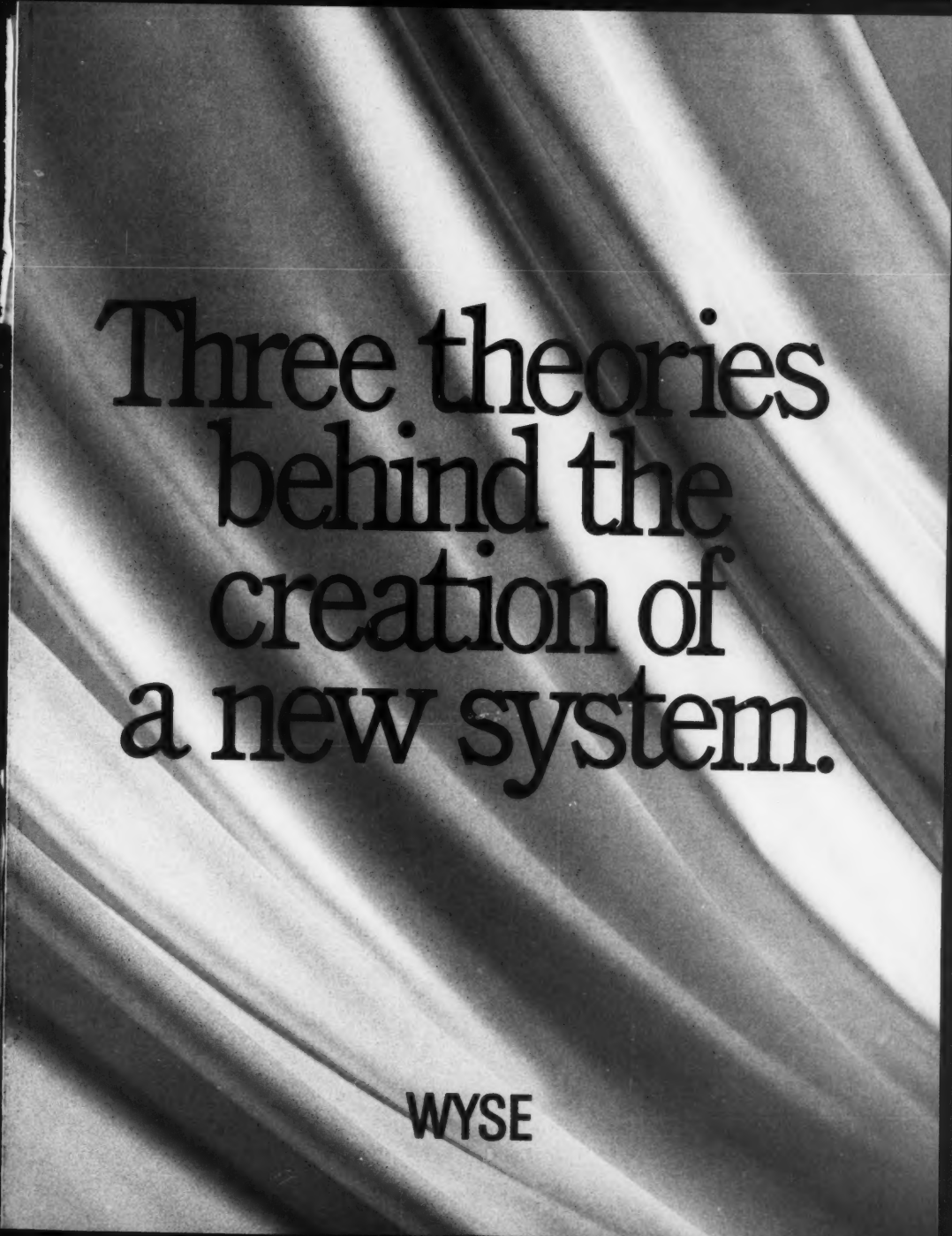
### FOCUS Education

- Over 200 certified staff trainers
- Scheduled classroom education at 40 North American centers
- Customer-site training
- Courses and training materials customized to environment and application
- Computer-based training materials for the PC or mainframe at current release levels
- Self-study primers
- A Train-The-Trainer program

If you want your users to be pussycats, get more information on FOCUS. Call 1-212-736-4433, Ext. 3700. Or write Information Builders, Inc., Dept. A4, 1250 Broadway, New York, NY 10001. We'll send you something meaty.

PC/FOCUS is a registered trademark of Information Builders, Inc.

**FOCUS**  
Information Builders, Inc.



Three theories  
behind the  
creation of  
a new system.

WYSE

# The Big Bar





# ing Theory.



In the beginning, there was power. When Wyse engineers set out to create a new personal computer family, their objective was not merely to design a new system, but to design a new *design*. Criterion one was power with total compatibility: higher performance for industry standard operating systems and applications. Today's and tomorrow's.

Introducing SystemWyse,<sup>™</sup> a comprehensive system for creating solutions. At its core are four new Wyse computers which set higher standards of performance for every level of PC user.

At the top, the new WYSEpc 386 has one of the highest benchmark ratings yet for a personal computer. Our unique design harnesses the 16 MHz 80386 microprocessor to achieve exceptional memory speed as well as processing speed. The result is a zero wait state system for high speed processing on multiple operating systems, such as MS-DOS,<sup>®</sup> OS/2,<sup>™</sup> and Xenix.<sup>®</sup> As an engineering work station, a high power spreadsheet processor, a multi-user system, or a network server, it is a system to satisfy the insatiable.

The same Wyse design ingenuity maximizes the effective power of the 80286 microprocessor as well. In our 8 MHz general purpose 286, our 12.5 MHz professional desktop system, and our 12.5 MHz zero wait state high performance system. At Wyse, overachievement just seems to run in the family.

*The WYSEpc 386 driving our VGA color monitor. WyseWindow<sup>™</sup> LCD provides system status and activity readout.*

**WYSE**

We make it better, or we just don't make it.

# The Theory

Survival of the system demands the ability to adapt to an ever-changing environment. Traditional PC design applied to most systems today virtually guarantees their extinction sooner rather than later.

It occurred to the Wyse engineering team that, with rapid change the only true constant, the intrinsic ability to adapt readily to new technology was essential in the ideal PC design.

For example, by incorporating all active functions on plug-in cards, we could make upgrading or reconfiguring our computers literally a snap.

From this simple concept emerged the most practical PC design of the '80's—and 90's: the Modular Systems Architecture™ we developed for SystemWyse.

This new design gives PC purchasers, at last, a means to protect their investment against Dreaded Obsolescence. The CPU itself is a plug-in card. So, for example, you can upgrade our general purpose 8 MHz model to a 12.5 MHz high performance 286 machine—or even a 16 MHz 386—as easily as you'd add a graphics board to a traditional system. And when more powerful microprocessors are available, you'll even be able to boost the



power of our top-of-the-line WYSEpc 386.

To achieve such flexibility, Wyse applied mini-computer design concepts to the internal architecture of our PCs. Our new passive back plane accommodates as many as 10 plug-in cards that perform all necessary functions, and then some.



*It's this easy to upgrade CPUs—and boost the power—of a SystemWyse PC.*

# y of Evolution.



6. With total interchangeability, Wyse already makes available a wide array of graphics, memory expansion, and interface modules.

Our design also increases ease of repair and accommodates customized configurations *ad, virtually, infinitum.*

In a world in which survival belongs to the fittest, the only true survivors are those with the capability to remain fittest, longest. This is a theory applied with great practicality in SystemWise.

Three SystemWise graphics solutions: our 8 MHz desktop with a Wyse VGA monitor; our 12.5 MHz professional desktop and VGA color monitor; and our 12.5 MHz, zero wait state system driving the WY-700 hi-res graphics display.

## WYSE

We make it better, or we just don't make it.

# The Theory

## It all works together.

Most of all, SystemWyse is a system for creating solutions. Uniquely integrated solutions that range from desktop publishing installations and powerful CAD/CAE workstations, to 16-node multi-user systems. All are based on industry standard operating systems, with over 1000 *tested* applications available.

At the heart of SystemWyse are our Modular Systems Architecture computers. They're the most powerful PC family in the business. And, with more possible configurations, the most flexible.

But SystemWyse also encompasses an entire catalog of compatible, superbly designed peripherals. Including one of the industry's most popular lines of computer terminals. Color and monochrome monitors

(VGA, EGA and CGA compatible) and high resolution graphics subsystems. Plus memory expansion, graphics, and interface modules. All are designed and manufactured by



*A SystemWyse Desktop Publishing solution: our 12.5 MHz professional system coupled with our WY-700 hi-res graphics subsystem.*

Wyse to link effortlessly, and work together in singular harmony.

It's all driven by a unified design vision. That's why SystemWyse has a look and feel that's consistent throughout. Computers and terminals with identical screens and keyboards. Styling that has set a new standard for the industry. And user-oriented features that are the hall-

*WYSEpc 386 drives our 19" color monitor for CAD/CAE applications.*



mark of Wyse design.

Such as the advanced ergonomics. The crisp characters and high resolution screens of our terminals. The clarity and vivid colors that distinguish our monitors. The built-in help facility and simplified set-up menus of our systems.

Standing behind our ability to deliver on the promise of SystemWyse is our unique manufacturing capability. As one of the industry's most vertically integrated producers, we make all our own



# Proof of Relativity.



products. And we make virtually everything from the ground up. While most companies use sub-assemblies purchased from someone else, we gain infinitely greater manufacturing control by beginning with components.

The result is a means to create solutions of manifestly superior quality and value. Solutions that are at once both elegant, yet relatively easy to construct. Solutions that seem custom designed for each specific application. We call them, simply, "SystemWyse solutions."

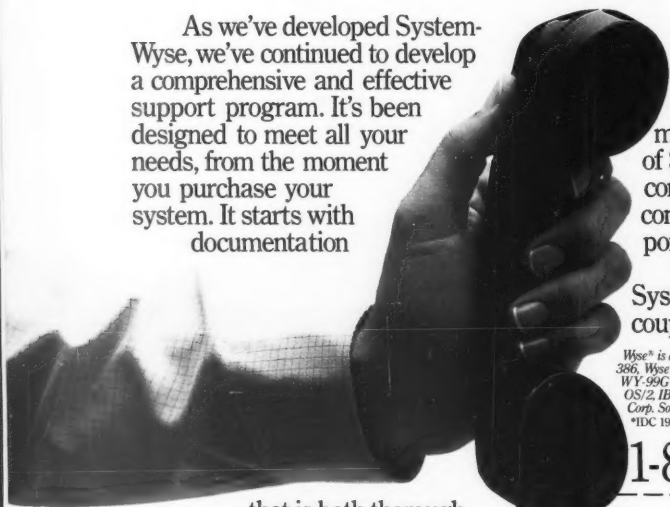
*A WYSEpc 386 powered multi-user system, with our WY-60 alphanumeric and WY-99GT graphics terminals as work stations. All peripherals link to the system with simple telephone-type connectors.*

**WYSE**

We make it better, or we just don't make it.

# The conclusive support for our theories.

As we've developed SystemWyse, we've continued to develop a comprehensive and effective support program. It's been designed to meet all your needs, from the moment you purchase your system. It starts with documentation



that is both thorough and understandable. For easy-access post-sale support we provide a staff of technical experts in the field plus a hotline to answer your questions. And you are probably now within 50 miles of a Wyse service center. We also conduct continuous software testing to ensure compatibility and beta site testing for independently developed custom applications.

It's the kind of support that's helped Wyse become second only to IBM in manufacturing terminals\*, with over one million shipped. And it's all part of SystemWyse. Which makes our concepts of power, flexibility, and connectivity three of the best supported theories around.

For more information about SystemWyse, call today or mail the coupon below.

Wyse® is a registered trademark of Wyse Technology. SystemWyse, Wysepc 386, Wyse Window Modular Systems Architecture, WY-700, WY-60, WY-99GT are trademarks of Wyse Technology. Other trademarks/owners: OS/2, IBM/International Business Machines; MS-DOS, Xenix/Microsoft Corp. Some screens courtesy of Boeing Graph.  
\*IDC 1986 U.S. Terminal Census.

## 1-800-GET-WYSE

Please send me more information on SystemWyse.

NAME \_\_\_\_\_  
TITLE \_\_\_\_\_  
COMPANY \_\_\_\_\_  
PHONE \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP \_\_\_\_\_

Mail to: Wyse Technology, Attn: Marcom Dept. SW8,  
3571 N. First Street, San Jose, CA 95134.

## WYSE

We make it better, or we just don't make it.

# NETWORKING

## DATA STREAM

Thomas Davenport

### Educating telecom staff



MIS executives and others who set their companies' information strategy for the coming decade had better think about educating telecommunications professionals — if they have not already begun to do so.

With the 1990s will come a new set of job demands; to meet them, telecom managers will have to be business-oriented, applications-driven and functionality-concerned. They will also have to be knowledgeable about data communications issues. That spells trouble for those who have been technically oriented, cost-driven and concerned only with voice issues. Let's look at the evidence.

Much has been said about how the telecommunications environment is changing. By the early 1990s, a lot of this change will have happened. Voice and data will be combined at the desktop and across global networks. Integrated Services Digital Network will be a reality. Network management will be highly automated. Bandwidth will be managed as a corporate asset. Communications capabilities will be an integral compo-

*Continued on page 63*

## 3M will take the ISDN plunge

*Launches ambitious million-dollar project over five-year span*

BY KATHY CHIN LEONG  
CW STAFF

ST. PAUL, Minn. — While most Fortune 1,000 companies have adopted a wait-and-see attitude toward the Integrated Services Digital Network (ISDN), 3M Co. has embarked on an ambitious project to replace its entire telecommunications system with ISDN gear during the next five years.

Although 3M officials would not specify how expensive the project will be, they said they are certain the plan to equip employees with ISDN telephones and

terminals will cost millions of dollars.

While most other ISDN projects in the U.S. today are pilot programs, 3M's installation will be a working business network planned for the long haul, 3M officials said.

#### Planning links

The company's five-year plan calls for two regional Bell holding company subsidiaries, U.S. West Information Systems and Northwestern Bell, to link up some 18,350 employees spread across 23 3M locations here and in Minneapolis.

Another long-term goal is to tie Texas sites with the network in Minnesota, according to 3M MIS Manager Marke Greene, who is based in Austin, Texas.

According to Greene and Keith DeStasio, another 3M MIS supervisor, the implementation will give the company three key benefits: flexibility in using nonproprietary customer-premise equipment; cost savings through minimizing the number of telephone lines for each employee; and "networking synergism" between 3M facilities in St. Paul and a new corporate site

*Continued on page 63*

## MNP's role as standard still at issue

BY ELISABETH HORWITT  
CW STAFF

GENEVA — Representatives from U.S. and European modem makers and European Postal Telephone and Telegraph authorities who met here recently were unable to reach an agreement about what part the Microcom Networking Protocol (MNP) should play in an evolving CCITT error-correction standard for modem-based transmissions.

MNP, an error-correction protocol developed by modem maker Microcom, Inc., is currently supported by all major value-added network vendors and "everyone who makes V.22 bis modems except Hayes Microcomputer," according to Microcom Vice-President of Technological Planning Gregory Pierson.

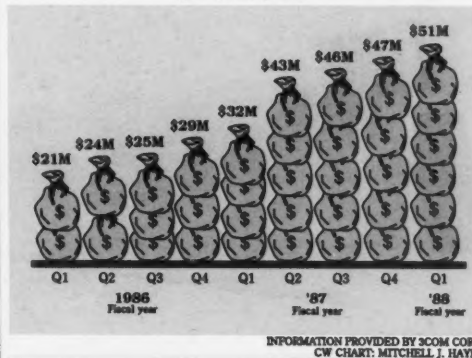
However, there is also strong support in the communications industry for an error-correction standard based on Link Access

*Continued on page 60*

## Data View

### The bride's dowry

*The completed merger of Bridge with 3Com forms a union with close to \$200 million in revenue and a compound annual growth rate of 57%*



## Fiber system links LANs

BY ELISABETH HORWITT  
CW STAFF

YONKERS, N.Y. — Codenoll Technology Corp. is set to announce this week a fiber-optic networking system supporting a wide range of protocols, including IBM's Token-Ring, Ethernet, the Manufacturing Automation Protocol (MAP) and, later, the Fiber Distributed Data Interface (FDDI) standard.

The Fiber Optic Cabling Universal System, which will be unveiled at Novell, Inc.'s Networkworld show in Dallas, allows users to use one fiber-optic cabling system and network hub to support

*Continued on page 56*

### Inside

- Excelan ties Xenix via TCP/IP. Page 56.
- Dialcom, Western Union add X.400 services. Page 60.
- Standard Microsystems offers Arcnet product line. Page 66.

`printf("Hello, MAINFRAME ^ world\n");`

### Meet the Industry's New Standard for Mainframe C Compilers

SAS Institute Inc. announces a mainframe version of the Lattice® C compiler—your key to truly portable applications.

With our compiler, you can develop C programs on IBM 370 machines, interface easily with non-C programs and software packages, and protect

your programming investment across operating environments. Virtually every new computer supports C, and portable programs created with the mainframe compiler under OS or CMS will run on any other machine with a C compiler.

The mainframe compiler uses standard IBM linkage conventions. Assembler programs, MAIN routines in other high-level languages, and packages such as IBM's ISPF and GDDM can be invoked directly from C.

And you can use C, instead of assembler, to develop small and fast subroutines called from other languages.

We designed the compiler listing and cross-reference to make programs easy to follow and errors easy to find. An extensive library offers functions from Kernighan and Ritchie and the Lattice PC C compiler. The run-time library produces explicit numbered error messages and a traceback of active function calls if an error occurs.

For all the facts—including details on economical annual licensing complete with free technical support and enhancements—call your Software Sales Representative today.

SAS is a registered trademark of SAS Institute Inc. Lattice is a registered trademark of Lattice, Inc.

Copyright © 1986 by SAS Institute Inc. Printed in the USA.

**SAS**

SAS Institute Inc.  
Box 8000 □ SAS Circle  
Cary, NC 27511-8000  
Phone (919) 467-8000  
Fax (919) 469-3737



# Using ONEsales has

Decreasing sales costs while you increase sales has always been the name of the game.

Now, there's a way to win it. ONEsales.

ONEsales is a fully integrated minicomputer-based sales management system that lets you track and manage your sales effort like never before. Identify and convert your hottest prospects more often at

less cost.

ONEsales is a capability of Honeywell Bull's ONE PLUS integrated departmental computer system. Specifically developed to automate your sales operation. Make it more efficient. And inspire your sales staff to set and meet higher goals.

A simple, practical solution, created to help you

# Customers are more important



**LY SALES**



its ups and downs.

excel, ONEsales finally gives you a computer system that is a real selling tool.

Join the growing number of leading edge companies who are recognizing the competitive advantage of a fully automated sales and marketing effort. If sales are your lifeblood, then ONEsales is a shot of adrenaline.

**You can demonstrate the capabilities of ONEsales for yourself. Call or write for your free ONEsales demonstration diskette.**

For more information call 1-800-328-5111, ext. 9735 or write Honeywell Bull Inc., MS440, 200 Smith Street, Waltham, MA 02154.



than computers. **Honeywell Bull**

BIT BLAST

# Excelan ties Xenix via TCP/IP

Excelan, Inc. in San Jose, Calif., recently announced the availability of Exos 10614T, a turnkey package said to allow users of Santa Cruz Operation's (SCO) Xenix System V to communicate with a wide variety of systems using the Transmission Control Protocol/Internet Protocol (TCP/IP) networking protocol. It also supports SCO's Xenix-Net Distributed File system.

Concurrently, SCO announced Xenix-Net 1.2, which incorporates a generic Xenix-IBM Netbios device driver. The two vendors' products, working together, allow users of Microsoft Corp. MS-DOS-

based applications to access files on a Xenix system through a TCP/IP connection. Available now, Excelan's Exos 10614T is priced at \$1,295 for both the board and the software and at \$595 for just the TCP/IP software. SCO's Xenix-Net 1.2 is available now and costs \$595 for a single-server license.

Micro Tempus, Inc. in Montreal has signed cooperative agreements that will bring its micro-to-mainframe software products to a greater range of equipment.

One agreement reportedly calls for migrating Micro Tempus's Tempus-Link,

Tempus-Access and Tempus-Share products to hardware links provided by Italian computer manufacturer Ing. C. Olivetti & Co.

According to the terms of a second agreement, Micro Tempus will work with Digital Communications Associates, Inc. (DCA) to develop compatibility between the Tempus product line and DCA's recently introduced Irmalan 3270 and Irmalmax DFT communications product families. Micro Tempus already supports DCA's existing Irma line of terminal emulation boards.

Yet another networking product on IBM's Netview bandwagon: Paradyme Corp. recently announced Analysis NV/PC, which is said to allow the ven-

dor's Analysis 6510 or 5530 network management systems to send Autoscan alarms to IBM's host-based network management system via the Netview/PC interface.

Pacific Bell will soon join the ranks of Bell operating companies that offer Digital Data Service (DDS) with Secondary Channel support.

Up until about a year ago, DDS was typically offered with an in-band 8K bit/sec. channel for transmitting control and diagnostic information.

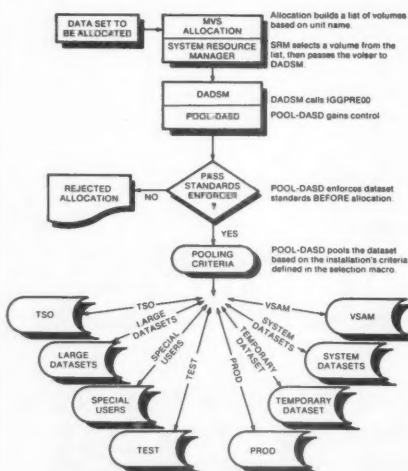
Secondary Channel support allows digital devices and carrier-based links to be managed by the same diagnostic and monitoring systems that manage analog facilities, industry sources say.

Over 1,000  
companies worldwide  
are benefitting from  
Empact Software  
products including:



Dynamic Data Set Pooling And Standards Enforcement

## POOL-DASD SYSTEM FLOW



POOL-DASD is an IBM MVS mainframe software product that dynamically controls data set pooling and enforces installation data set standards. POOL-DASD operates as a "frontend" to the DADSM pre-processing and post-processing exits (IGGPRESS/IGGPRESSO). POOL-DASD gets control during the five basic DADSM functions: Allocate, Extend, Release, Scratch, and Rename.

- Requires No JCL Changes
- No EDTGENS
- No IPL's
- Is Macro Driven
- Runs In Real Time or Warning Mode
- Makes Pooling Easy
- Improves DASD Utilization
- Saves People Time
- Enhances Management Control
- Facilitates Disaster Planning

Other Empact Software products include:

WTO-MANAGER: The product that automates the MVS console and computer operations.  
STOP-X37: The software product that stops B37, D37, E37, and Abends.

**EMPACT** SOFTWARE INC.

Corporate Headquarters  
1275 Parker Road, Conyers, Georgia 30207  
(404) 483-8852

## Fiber

CONTINUED FROM PAGE 53

whatever networking protocols they need to install, according to Codenoll President Michael Coden.

Workstations equipped with standard networking boards are linked to a Codenoll Codestar hub in a star configuration. Hubs within a given area are then linked via a larger hub, called the Multiport Multiconnect Repeater, also scheduled to be introduced at Network World this week. The Multiport Multiconnect Repeater supports up to 15 Codestars. Priced at \$1,095, it is scheduled for December availability. In addition, Codenoll is expected to announce new Starcoupler technology that halves the price of Codenoll workstation hubs, according to Coden. Two Codestars will be introduced, a seven-port hub priced at \$1,195 and a 19-port hub priced at \$2,195. The products are available now.

Codenoll can be reconfigured to support different types of networking protocols by switching Codenoll adapter cards, Codenoll said. The vendor offers the following adapter cards:

- Codenoll 3402, priced at \$695, which supports fiber-optic Arcnet.
- Codenoll 3051, priced at \$995, which supports Ethernet boards from 3Com Corp., Novell and other vendors.
- Codenoll 3061, priced at \$1,195, which supports workstations running IBM's Netbios over IBM's PC Network or Token-Ring.
- Codenoll 3410, priced at \$995, which supports MAP networks.

All of the products are available now, Codenoll said.

### More to come

Codenoll plans to introduce products that implement the IEEE 802.6 FDDI standard "just as soon as Advanced Micro Devices and National Semiconductor come out with chip sets" that enable the network vendor to implement FDDI at affordable prices, Coden said.

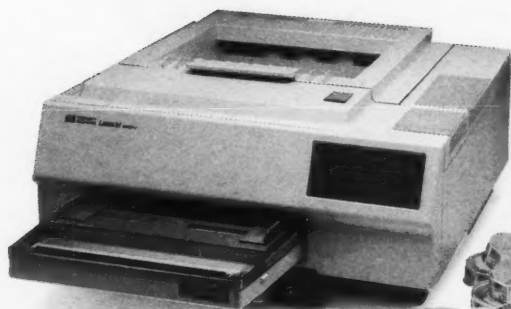
Currently, the two chip vendors are citing a one-year time frame, but Coden said he expects further delays.

The FDDI system, unlike other networking interfaces, will require Codenoll users to take out their existing Starcoupler and substitute a new box, Coden said.

The vendor's fiber-based products will be used at Network World to connect Novell servers as well as workstations and networking products at 250 exhibits throughout the show floor, Coden said.

we never  
stop  
asking

"What if..."



HP LaserJet  
Series II Printer

Over three million documents a day start  
with the same two letters. HP.

More businesses use HP laser  
printers for spreadsheets, letters,  
newsletters and reports than all  
other laser printers combined.

And the newest of the HP fam-

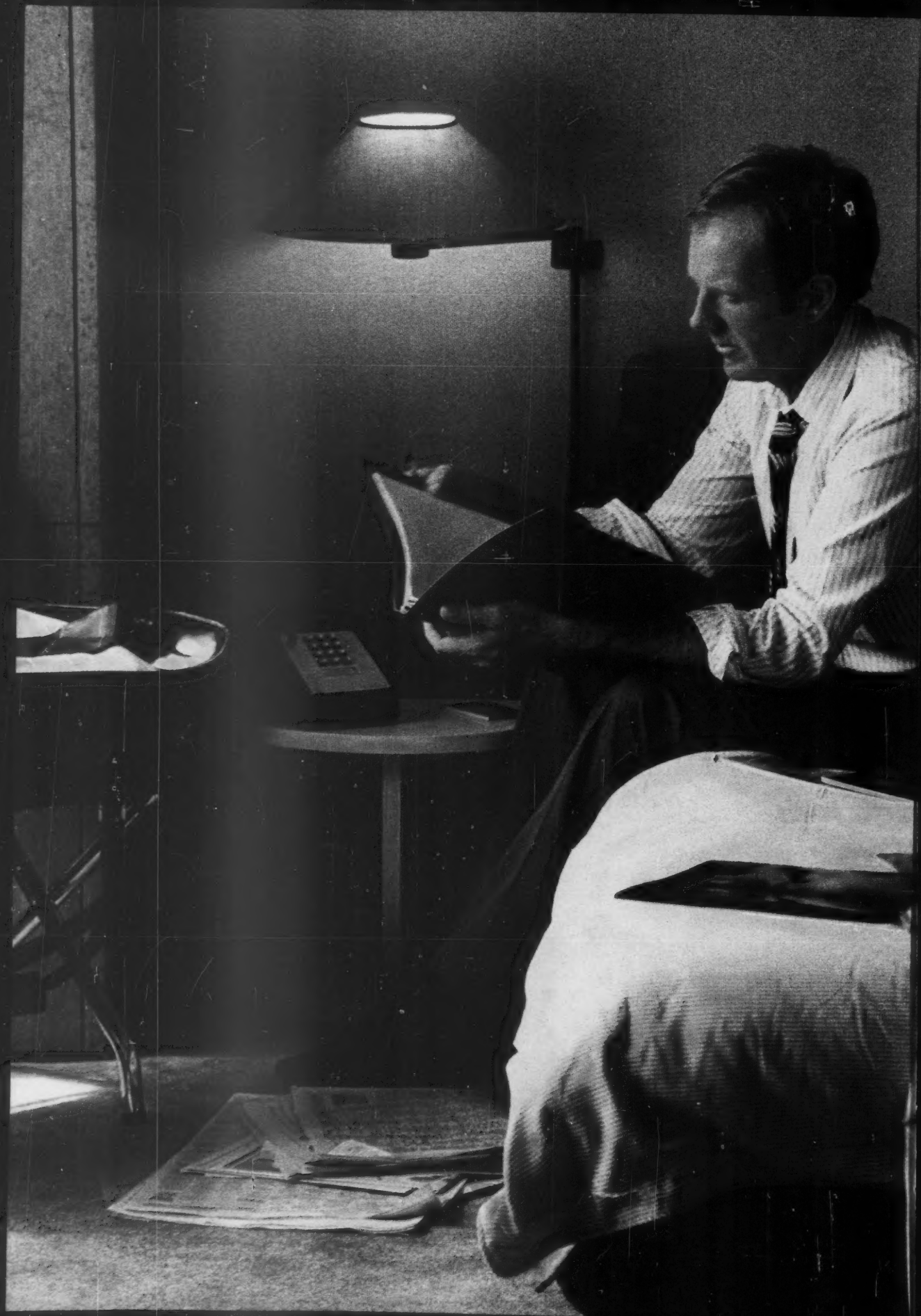
ily, the LaserJet Series II Printer,  
offers even more memory and  
fonts than before.

It supports over 600 software  
products and all popular PC's, too.

No wonder more people choose  
Hewlett-Packard over all other  
laser printers combined.

For your local dealer or a brochure,  
call 1 800 752-0900, Ext. 900B.







**“After ten years of trade shows, you figure any real news about 3270s is going to come from IBM. Then somebody hands you a spec sheet that changes everything.**

*I can see he's excited, but all he says is, 'You won't believe this.' It seems that what IBM didn't do—AT&T's been doing for a year. Namely, connecting Sync and Async environments. Now all our guys who need numbers from the VAX\* down the hall and the 3083 at corporate don't have to hop back and forth between displays. Now they can get the numbers they need to close a sale while they've got a customer on the line. Booth 16-E hadn't been real high on my list. AT&T's booth. Now here they are playing in IBM's park. And hitting home runs.*

**AT&T comes through.”**



### **The AT&T 6500 Multifunction Communication System**

**Sync and Async support:** Merges mainframe, mid-range and micro-computing environments in a single controller.

**IBM® 3270 functionality:** SNA/SDLC, BSC, Protocol Conversion, X.25, others.

**Multi-host connectivity:** Links up to three 3270 hosts and 32 Async processors, PCs or displays.

**True windowing:** Multiple concurrent session capability through four live windows.

**Modular expansion:** permits feature-driven system migration.

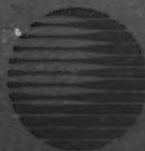
To learn how AT&T packs so much into one system, or to arrange a demonstration, call 1 800 247-1212.

From equipment to networking, from computers to communications, AT&T is the right choice.

\*VAX is a trademark of Digital Equipment Corp.

\*\*IBM is a registered trademark of International Business Machines Corp.

©1987 AT&T



**AT&T**

**The right choice.**

# Dialcom, Western Union add X.400 services to E-mail

BY PATRICIA KEEFE  
CW STAFF

Two major suppliers of electronic mail systems and services recently introduced services based on the CCITT X.400 standard for communications between dissimilar message systems.

Dialcom, Inc. in Rockville, Md., announced U.S. commercial availability of its X.400 message-handling service (MHS) for public and in-house systems. Western Union Corp. in Upper Saddle River, N.J., said it will provide X.400 and document-transfer capabilities on its Easylink E-mail service in the first half of 1988.

The company also said it will develop two-way facsimile service through Easylink and Telex services and will introduce a version of its Instant Mail Manager communications software to run on Apple Computer, Inc. Macintoshes.

In addition, Western Union is proceeding with the implementation of a comprehensive electronic data interchange service on Easylink, with beta testing currently in progress.

The X.400 MHS is part of Dialcom's new Pathfinder electronic message-handling and message-interchange services. These services include interconnects to

private E-mail systems and message interchange among Dialcom's 17-country, 260,000-member international user network. Dialcom also said it will be British Telecom's preferred gateway for X.400 message traffic from the U.S. to England. In addition, the vendor announced that its X.400 system is linked to two public X.400 messaging systems — British Te-

**DIALCOM CLAIMED** it has successfully completed compatibility tests with the in-house X.400-compatible E-mail systems developed by Digital Equipment Corp. and Data General Corp.

lecom Gold in the UK and CNCP Telecommunications in Canada. Telecom Gold launched Gold400 in June, while CNCP, now in beta-test mode, is said to be planning its launch by year's end.

Dialcom claimed it has successfully completed compatibility tests with the in-house X.400-compatible E-mail systems

developed by Digital Equipment Corp. and Data General Corp.

Message interchange for IBM's Professional Office Systems and Wang Laboratories, Inc.'s Office mail systems will be added by early 1988, the vendor said. The first demonstration of Dialcom's Administrative Domain software that works with IBM's version of X.400 will be at Telecom '87 this week in Geneva. In addition, Dialcom will work with other hardware and software vendors of E-mail systems as soon as they develop their X.400 software.

Among those working on X.400 software is Western Union, which said the scheduled cutover of its X.400-based MHS in early 1988 will facilitate the connection of Easylink with other X.400-based domestic and international electronic-messaging systems. Testing on the X.400 service will begin next month with a European administration.

The document-transfer program will make it possible to send documents in reversible form between dissimilar word processors and software packages, the vendor said.

The facsimile-to-Easylink or facsimile-to-telex delivery option, currently under development, will make it possible to send documents in reversible form between dissimilar word processors and software packages, the vendor said. It also will expand Western Union's delivery capabilities to let users send text messages directly from a facsimile machine for delivery via any Easylink messaging option.

Used in conjunction with the Easylink binary file-transfer capability introduced earlier this year, the Macintosh version of Instant Mail Manager will include file transfer with X-PC error detection and correction protocols.

## MNP's role

CONTINUED FROM PAGE 53

protocols (LAP), some of which are part of the Integrated Services Digital Network (ISDN) standard.

The group, which met for more than a week under CCITT auspices, could not reach the consensus necessary to make a formal recommendation to the standards committee on what the CCITT protocol should embody, according to Fred Burg, an AT&T Bell Laboratories Standards Planning Department supervisor who attended the meeting. Participants agreed to recommend that the future standard be compatible with the existing installed base of MNP modems and that MNP be incorporated into the standard.

However, Burg said, the group could not reach a consensus on what part of the standard would hold MNP: the main body or the appendix. "If MNP is in the appendix, then conformance to the protocol is not sufficient for conformance to the CCITT standard," he explained.

MNP would only become part of the main body of the standard as an alternative to a LAP-based protocol, which the group agreed "would be included in the standard as the basis for all future development," Burg said. Systems supporting MNP would not be able to communicate with LAP-based systems unless they dispensed with error-control protocols entirely, he said.

During the meeting, Hayes Microcomputer Products, Inc. submitted a proposal for modem vendors to implement both protocols. The group determined that a second set of error-correction code would take up between 5K and 10K bytes of read-only memory, resulting in a cost hike of \$1 or \$2 per modem, Burg said.



## We do Windows

In fact, we ARE the window people. CICS-WINDOWS, developed by our company, provides a software solution to the three major demands made by terminal users. With CICS-WINDOWS, which installs in one hour, you will enjoy...

**Multiple Sessions Manager**  
Improve performance of terminal users by providing instant access to transactions.


**Window Manager for Mainframes**  
Open windows on your terminal to use multiple transactions on the same screen.

**Data Compression Optimizer**  
Improve response time up to 40%.

For information or **FREE TRIAL** OFFER call:

**1-800-544-3036**

**STS** SOFTOUCH SYSTEMS, INC.  
8269 South Walker  
Oklahoma City, OK 73139  
405/632-4745



## THE FUTURE OF INFORMATION SYSTEMS REVEALED!!

Come to the computer seminar that puts all the pieces together. . .

### THE JAMES MARTIN SEMINAR



Five intensive days with the computer industry's top man will give direction to your strategic planning and help solve your current DP problems to maximize your bottom line.

**TORONTO, November 2-6, 1987**  
**NEW YORK, November 30-December 4, 1987**  
**ORLANDO, December 7-11, 1987**  
**LOS ANGELES, February 8-12, 1988**  
**DENVER, February 29-March 4, 1988**

Join the man who Computer Weekly describes as "the computer industry's most widely read author and best attended lecturer." He has written over 50 best-selling books on computer/communication technology.

**Call (213) 394-8305, ext. 401**  
to register or to request a detailed course brochure.

**Technology Transfer Institute**  
741 North Street, Santa Monica, CA 90402-2800  
Fax: (213) 451-2104 • Telex: 404-8322

# Workgroup Computing With Dick And Jane.



See Dick run his word processor.  
Run Dick run.

See Jane run through a spreadsheet.  
Run Jane run.

See Dick send electronic mail to Jane.  
See how simple? See what fun?

This is what passes for Workgroup Computing today.  
See how sad.

Let Motorola show you what Workgroup Computing is really all about.

# Workgroup Computing With Real People.





See the Publicity workgroup create their own automatic routing application. Even though none of them know COBOL from a hole in the ground.

See the Order Entry group use a format as simple as a bingo card to process twenty *thousand* on-line credit checks every day.

See the Investment team in Detroit use a Lotus 1-2-3® spreadsheet, on one PC, to update databases on five mainframes, twelve minis, and forty LANs from Palm Beach to Puget Sound.

See what real workgroups could do with a real workgroup system?

At Motorola, we not only saw it. We built it.

And we call it LIfe. The Linked Information Environment.

At last, a system of computer applications that really work together, for people who work together.

# Motorola Intro Real World Solutions

**LifE**  
Linked Information  
Environment

Every millenium or so, an idea is born that makes a quantum leap over business as usual. LifE is one of them.

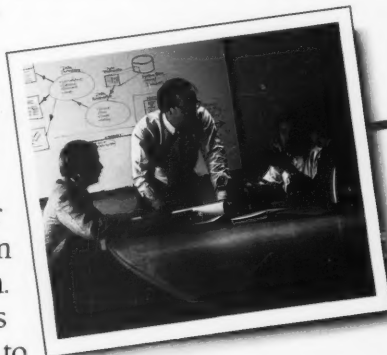
It lets your workgroup create electronic forms that perform all kinds of tasks automatically.

LifE's forms are *intelligent*, because you can bury commands in them—like formulas imbedded in a spreadsheet. They're also "live"—the commands stay active and travel with the form.

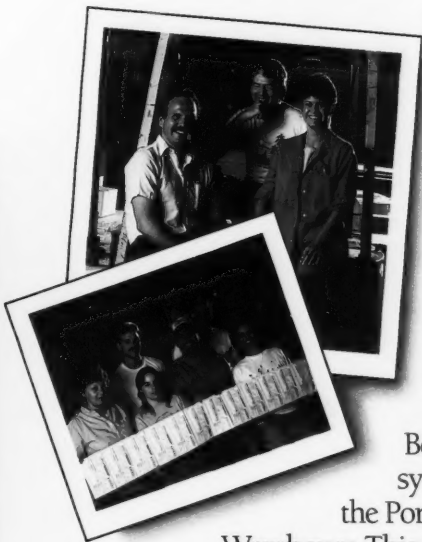
So your forms take on lives of their own, carrying out your instructions by themselves.

For instance, a Sales workgroup uses LifE to design their own custom Order Form. It only takes 30 seconds to fill out, but can do an hour's worth of work.

Like sending a copy to Accounting. Where LifE changes it into a personalized



# roduces LiFE. For The Workgroup.



At the  
same  
time, the  
original  
Order  
Form  
pops up  
on "Big"  
Bob's LiFE  
system, at

the Portland  
Warehouse. This time it  
appears as an Inventory Control Form.  
Which, in turn, fills in a preprinted shipping  
form, charges and all.



Customer Service gets a copy,  
too. They  
used LiFE to  
design a  
Scheduler  
which will  
remind Sales  
to call the  
customer

again in 60 days. (Remember Sales? They  
started all this).

LiFE has also been piping the infor-  
mation to the VP of Marketing in the form

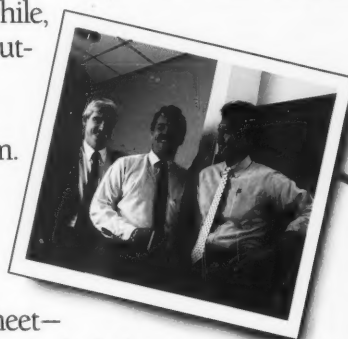
It only takes 30 seconds to fill out, but can do an hour's worth of work.

Like sending a copy to Accounting. Where LiFE changes it into a personalized Invoice.

The Invoice has commands imbedded in it, too. One of them prints the Invoice on a remote laser printer. Another forwards the information to the Credit Department. Where a workgroup has designed a LiFE form that runs customer credit checks. Sends reports back to Accounting and Sales. And updates corporate credit records.

Meanwhile, LiFE's been routing the same data to the Financial team. Where it arrives, not as a form at all, but as a "live" spreadsheet—active formulas included.

So they can "what-if" with the freshest numbers available.





again in 60 days. (Remember Sales? They started all this).

LiFE has also been piping the information to the VP of Marketing, in the form of vivid 3-D



charts and graphs. Which she'll use to dazzle the other members of her workgroup, the Board of Directors.

And this whole chain of events started with a single key-stroke, on one LiFE form.

## Don't Let LiFE Pass You By.

Have your workgroup call our workgroup for a demonstration, at 800-556-1234, Ext. 165 (in California, 800-441-2345, Ext. 165). Or contact your nearest Motorola Computer Systems sales office, listed on the back.

One look at LiFE may change yours forever.



**MOTOROLA**  
**Computer Systems**

**Arizona**

Phoenix (602) 230-8011

**California**

Irvine (714) 474-6946  
Los Angeles (213) 670-8430  
Sacramento (916) 451-5001  
San Francisco (415) 873-9073

**Colorado**

Denver (303) 770-7600

**Connecticut**

Hartford (203) 678-0440

**District of Columbia**

Washington (703) 749-0700

**Florida**

Orlando (305) 831-5354  
Miami (305) 362-4446

**Georgia**

Atlanta (404) 955-0100

**Illinois**

Chicago (312) 576-5500  
Springfield (217) 789-0033

**Indiana**

Indianapolis (317) 872-5076

**Kansas**

Kansas City (913) 451-9150

**Michigan**

Detroit (313) 645-6060

**Minnesota**

Minneapolis (612) 893-1820

**Mississippi**

Jackson (601) 355-6476

**Missouri**

St. Louis (314) 576-6969

**New Jersey**

Rochelle Park (201) 845-0252

**New York**

New York (212) 382-3840  
Rochester (716) 248-2860

**North Carolina**

Charlotte (704) 542-1144

**Ohio**

Cincinnati (513) 772-3220  
Cleveland (216) 447-4490  
Columbus (614) 431-8690

**Oregon**

Portland (503) 644-4346

**Pennsylvania**

Philadelphia (609) 234-0200

**Tennessee**

Nashville (615) 361-4222

**Texas**

Austin (512) 444-7585  
Dallas (214) 888-2248  
Houston (713) 686-6399

**Utah**

Murray (801) 262-7000

**Virginia**

Richmond (804) 355-1001

**Washington**

Seattle (206) 455-2442



**MOTOROLA**  
**Computer Systems**

10700 North De Anza Boulevard  
Cupertino, CA 95014

# COMPUTERWORLD

## Now in our 20th year!

# Reporting the future since 1967...

For twenty years, COMPUTERWORLD has kept the Information Systems Professional right on top of the latest developments — and even slightly ahead. Because we don't just tell you what's happening now. We tell you what's about to happen, too. What to watch out for. What you can prepare for. What implications there are for you and your company's future. Get in on the future — now! With COMPUTERWORLD. During our 20th Anniversary Savings celebration.

Join  
the  
celebration  
and  
save!

### New or Current Subscribers

If you're not a COMPUTERWORLD subscriber now, sign up today! If you're already a subscriber, take advantage of this special opportunity to extend your current subscription at low Anniversary Savings. Use the self-mailing order form attached. Or call toll free 1-800-255-6286. (In NJ call 1-800-322-6286.) Don't miss out on this great celebration offer. Order now!

**JUST 58¢ AN ISSUE** One full year of COMPUTERWORLD (51 issues) costs just \$29.57, a big savings of over \$14 off the basic rate, and only 58¢ an issue. What better way to move into the next generation of technological advances than with COMPUTERWORLD — all for just 58¢ a week. You can't beat it. So join us — now!

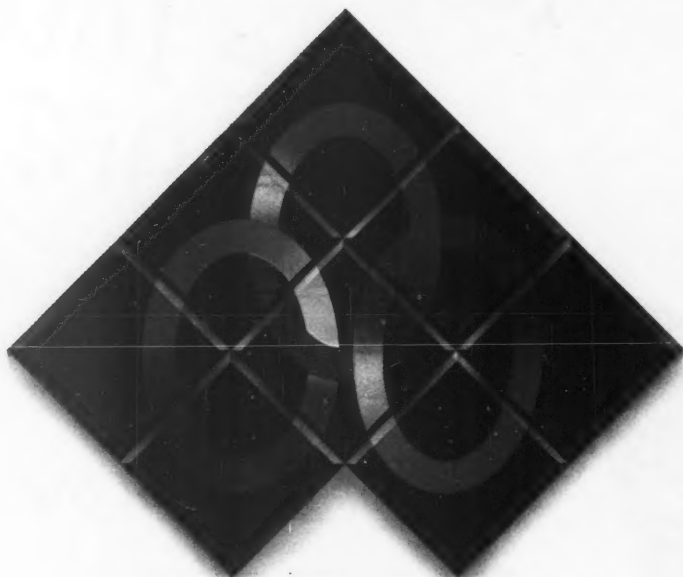
**PLUS 12 BONUS ISSUES** When you subscribe to COMPUTERWORLD, you also get 12 monthly issues of COMPUTERWORLD FOCUS at no additional charge. Each issue covers one particular topic. So you get in-depth analysis and comprehensive reporting of such timely subjects as microcomputing, communications, connectivity, software, and much, much more. Leading edge information — for subscribers only!



# COMPUTERWORLD



*NetView from IBM®*



*Net/Master™ from CINCOM®*

# NetView vs. NET/MASTER: What Is IBM Not Telling You?

## A Comparative Seminar.

If you feel NetView is the correct solution to your network management puzzle, maybe you should take a closer look. Take part in our upcoming seminar series, featuring an objective, third-party evaluation of IBM's NetView and NET/MASTER™ from Cincom®.

Each of these free half-day seminars will feature an in-depth look at major SNA network issues by guest speaker Michael Doss, Executive Vice President of Operations for Netlink, Inc.

One of the original designers of

11/3 Los Angeles	11/9 Washington, D.C.
11/4 Dallas	11/10 Atlanta
11/5 Chicago	11/12 Boston
11/6 Cincinnati	11/13 Toronto

IBM's SNA products, Mr. Doss will discuss the difference between NetView the concept and NetView the product, explain what IBM's recent Open Network Architecture announcements mean to you, plus evaluate and compare NetView and NET/MASTER.

All of which will help you more

effectively plan your network management strategy.

Register today for any of these informative events by writing NetView-NET/MASTER Seminars, Cincom, 2300 Montana Avenue, Cincinnati, Ohio 45211. Or call:

**1-800-543-3010**

In Ohio, 513-661-6000.  
In Canada, 1-800-387-5914.

 **CINCOM**



# Educating

CONTINUED FROM PAGE 53

nent of computer applications, not a general-purpose utility.

If you want your organization to be ready when the technology is ready, you will need to significantly upgrade the skills of your telecom staff in the following areas:

- Understanding the business strategies that drive telecommunications decisions.
- Understanding the technical underpinnings of computing and telephony and how they fit together.
- Knowing the agendas of vendors and being able to manage them rather than being managed by them.

- Expressing complicated business and technical arguments in clear, simple terms to senior managers.
- Managing large projects and large numbers of sophisticated employees.

How many of your telecom employees have this expertise? Many MIS managers complain that their telecom people have difficulty dealing directly with users, that they rely too heavily on vendors — AT&T in particular — and that they are not taking total responsibility for system operations and performance.

There are two ways to handle this situation if it exists in your company: educate your telecom managers or bring in new, skilled people.

Several communications vendors whose account executives need skills sim-

ilar to those of telecom managers are making massive investments in educating their people. Bell Atlantic Corp., for example, has a "Top Gun" program for its most talented account executives and systems designers. The program consists of 80 classroom days of education and covers subjects ranging from the value-added chain to data link protocols. AT&T has a similar program.

Some companies have taken the approach of bringing employees with primarily computing backgrounds into the telecom function. These people are more likely to be business-oriented and more conversant with applications and data issues. However, they typically know little about establishing and operating voice networks. The future will demand indi-

viduals who are accomplished in all areas of information systems.

Do not expect these considerations to remain the concern of information systems and telecom managers only. Senior executives are learning from executive education programs and business publications, as well as from each other, that information systems are strategic and communications are a big part of any systems application. And those managers will want to know that the telecom resource is being managed not only efficiently but in a way that will let their companies enter the Information Age.

Davenport is director of research at Index Group, an information management consulting firm headquartered in Cambridge, Mass.

# ISDN plunge

CONTINUED FROM PAGE 53

in Austin. "We know there is a certain amount of risk taking, but we wouldn't go into it if we didn't have a good understanding of ISDN," DeStasio said.

Greene stressed that the move to ISDN was a corporatwide decision. "We want to make this place a completely digital environment," he said. "We decided a number of years ago that our business strategy would be met best through ISDN."

A major catalyst for 3M's decision to go with ISDN was the realization that its current Centrex network, based on an antiquated analog central office switch, would not satisfy its telecommunications needs over the long term, according to officials.

The planned ISDN system will give users such features as the ability to view a caller's phone number and the ability to move phones without changing numbers. Some 200 workstations will initially be a part of the ISDN installation.

## Still in planning stage

Company officials are the first to admit that 3M's ISDN project remains in the planning stage. Real ISDN business applications have yet to be determined, they said.

But 3M stressed it will begin a user analysis as soon as the lines are installed. Issues that will need to be addressed include employee training, integrating 3M mainframe data centers that consist of IBM and Digital Equipment Corp. gear into the ISDN network and determining which applications will benefit most from the new technology.

The new network will employ existing twisted-pair telephone wire to handle simultaneous voice, data, image and facsimile transmission at a range of 9.6K to 64K bit/sec. It will use the ISDN Basic Rate Interface specification.

Local ISDN communications services in Austin will replace a Rolm Corp. CBX 9000 private branch exchange that the company has been using for several years. Greene said the company is not interested in being its own telephone company. Turning over responsibility to the local telephone company will be a relief, he said. The move to ISDN services will be a gradual evolution, DeStasio said.

"The [customer premises equipment] vendors are just beginning to manufacture ISDN terminals and devices. It will take time. And that's OK with us," he concluded.



## WHY DO SEVEN OF THE "BIG EIGHT" ACCOUNTING FIRMS CHOOSE REALIA COBOL?

Why Realia? Simple. Because we can help the best stay the best.

Realia COBOL is the fastest, most advanced application development tool available to bring the power of the mainframe right to your PC. You'll start saving time, money, and resources, whether you're maintaining an old system or creating a new one.

Realia COBOL offers your programmers the quickest compilation and the biggest file capacity of any PC compiler. A 10,000-line program compiles in 76 seconds. A 10,000-record sort takes 43 seconds. Best of all, Realia-compiled programs execute faster than any other PC compiler's. With RealCICS®, you can even handle online CICS programs.

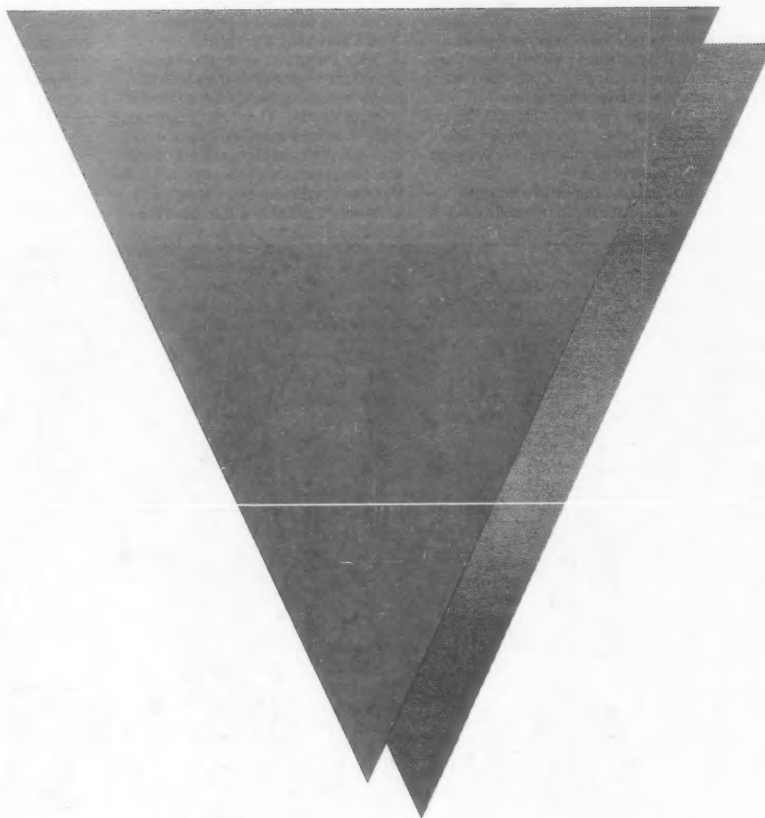
At Realia, we also offer you something that has become a bit of a contradiction in terms: genuine support for a micro software product.

Realia COBOL—simply the best choice.

# REALIA®

10 South Riverside Plaza, Chicago, IL 60606 • (312) 346-0642 • Telex 332979

**See us at**  
**COMDEX/Fall 87**  
**Booth #2116**  
Las Vegas Convention Center



▼  
**CORTELCO\***  
Second Largest U.S.  
Manufacturer of Telephones  
and Key Systems

▼  
**COURIER INFORMATION  
SYSTEMS**  
Leading Supplier of IBM-  
Compatible Display Systems

▼  
**FRIDEN ALCATEL**  
Innovative Supplier of  
Postage Meters, Mailing and  
Shipping Systems

▼  
**PABX SYSTEMS CORP.\*\***  
Supplier of Advanced Small  
and Medium Size PABX and  
Key Systems

# WHAT'S AN ALCATEL?

The shape of things to come.

Because this simple symbol represents Alcatel.

A group of over 240 companies formed by the joint venture of two of the world's leading specialists in the fields of computers and communications—ITT Corporation and CGE.

With sales of \$11.6 billion and more than 150,000 employees in 110 countries, Alcatel is the second largest combined supplier of public network equipment, telecommunications, and business communications systems and services in the world.

Now seven of Alcatel's U.S. companies have joined to form Alcatel Business Systems, each and all, sharing and benefiting from the resources of the parent company.

Resources that include one of the world's largest technology bases, R&D expenditures that exceed \$1 billion a year and a continuous corporate commitment to the business information

systems and communications marketplace.

With Alcatel Business Systems, you're working with the same ITT companies you always have. But now Alcatel's increased corporate focus and massive technical resources allow us to offer you even more comprehensive solutions.

Former customers of ITT and future customers of Alcatel can now take one thing for granted. Alcatel Business Systems is committed to a comprehensive program to provide American business with the finest integrated communications, business information systems and services available.

So when you start doing business with an Alcatel company, you know you will continue doing business with an Alcatel company.

That's why Alcatel is the shape of things to come.

For a very long time to come.



For more information on Alcatel and the Alcatel Business Systems companies, call 1-800-556-1234 (ext. 247) or in California 1-800-441-2345 (ext. 247); or write Alcatel Business Systems, 2350 Qume Drive, San Jose, CA 95131.

**QUME CORPORATION**  
Leading Manufacturer of  
Computer Peripherals

**SERVCOM**  
Computer Maintenance and  
Support Services

**XTRA BUSINESS SYSTEMS**  
Complete Line of High  
Performance Microprocessor-  
Based Computers

\*Formerly Apparatus Division of ITT  
Telecommunications.

\*\*Formerly ITT Business Commu-  
nications Corporation and Thomson CSF.

NEW PRODUCTS

# Local-area network hardware

Standard Microsystems Corp. has introduced a family of Arcnet products for personal computer local-area networks using twisted-pair cabling.

The product line features an Arcnet Network Controller Board that fits in an expansion slot of any IBM Personal Computer or compatible. Multiple PCs are connected to a single twisted-pair segment in a daisy chain or multidrop configuration. Network expansion is achieved by connecting twisted-pair segments with

a two-port Twisted-Pair Repeater, and a twisted-pair network can be connected to a coaxial network with a two-port Twisted-Pair Link. The Arcnet-PC250 Controller Board costs \$295. The Twisted-Pair Link and Repeater cost \$375 each.

Standard Microsystems, 35 Marcus Blvd., Hauppauge, N.Y. 11788. 516-273-3100.

# Customer-premise equipment

A switching CCITT X.25 packet assembler/disassembler (PAD) capability for local and remote data gathering in mixed

protocol environments has been announced by Develcon, Inc.

The product functions as a stand-alone switching PAD permitting up to 64 asynchronous subscribers to communicate through dual, independent links with both host mainframes and packet data networks operating under the X.25 protocol. The product also allows packet-to-packet transfers between X.25 connections.

Develcon, 6701 Sierra Court, Dublin, Calif. 94568. 415-829-6200.

# Links

A remote Ethernet bridge that is said to merge two distant Ethernet local-area networks into a single network has been announced recently by Advanced Com-

puter Communications.

The bridge, designated the ACS 4030, offers a choice between adaptive and static routing. Adaptive routing is a continual process during which the ACS 4030 automatically adjusts to the addition or removal of network devices. If access to specific network devices must be prohibited for security reasons, the manager can code restrictions into an ACS 4030 static configuration table.

The ACS 4030 is protocol-independent. Up to two modem lines with rates from 2,400 to 64K bit/sec. are supported.

The ACS 4030 costs \$4,975. Advanced Computer Communications, 720 Santa Barbara St., Santa Barbara, Calif. 93101. 805-963-9431.

# File servers

CYB Systems, Inc. has announced a high-end addition to its U68 series of Unite network processor servers.

A U68E processor server is said to be capable of providing network server and device sharing functions for up to 32 personal computer users while simultaneously delivering Unix processing to departmental terminals or PCs. A U68E configuration consisting of a Motorola, Inc. 68020 processor, 4M bytes of memory, a floppy drive, 778M bytes of disk, an Ethernet adapter, eight serial ports and two printer ports is priced at \$53,645.

That price includes Unix and Unite software licenses with documentation.

CYB Systems, Suite 2017 Infomart, 1950 Stemmons Freeway, Dallas, Texas. 75207. 214-746-5390.

# Electronic mail

Version 2.0 of Oatmail, the personal computer gateway to Digital Equipment Corp.'s Vaxmail and All-In-1 office automation systems, has been announced by OA Technologies, Inc.

Oatmail Version 2.0 allows PC users to create, send and receive All-In-1 mail and Vaxmail. It features a window-driven user interface, multiple host access, wild-card transfers, support for many data communication front ends and support for DEC's Ethernet LAT protocol.

Oatmail provides automated mail pickups, delivery and file-transfer capability. It includes DEC VT220 terminal emulation and a choice of transfer protocols. It costs \$300.

OA Technologies, 10001 Craig Road, St. Louis, Mo. 63146. 314-432-3622.

# Diagnostic equipment

A multiline dial backup system called the Restorer has been announced by Atlantic Research Corp.

The system is said to restore failed point-to-point and multipoint circuits by temporarily rerouting data through the dial-up network. It offers end-to-end restoration for leased lines, featuring the ability to share and allocate dial backup resources.

It also provides one integrated system interface for point-to-point and multidrop circuits.

The system is made up of the vendor's MDB-100 central-site dial backup unit, ADU-50 remote-site dial units and a terminal. It can interface up to 512 leased lines. Typical system prices range from \$13,000 to \$50,000.

Atlantic Research, 7401 Boston Blvd., Springfield, Va. 22153. 703-644-9190.

# 5 Promises Of Better Service To Computer And Telecommunications Equipment Users

When Encore International opened for business, we had an unusual advantage—a management and staff made up entirely of seasoned industry professionals. Chances are, you already know some of them... so you know what our company stands for.

**1. Dependability.** We thoroughly understand the business of acquiring, reselling, financing and remarketing new and used computer and telecommunications equipment, as well as capital equipment financing for many other assets. And we know that our future rides on our ability to meet every commitment we make.

**2. Financial Soundness.** From day one, we secured very strong capitalization. In itself, this testifies to the confidence the financial community has in our ability to serve and grow—now and in the future.

**3. Objectivity.** We draw on the full array of products manufactured by IBM, DEC, Amdahl, AT&T and other industry leaders. With no axe

to grind, we can be completely unbiased in recommending products that precisely fit your performance and financial requirements.

**4. Value-Added Marketing.** We focus on customer needs to achieve the exact balance of product performance and price that best fits them. We know how and where to secure the equipment and financing you need—how to get it at the right price—how to live up to our delivery commitments.

**5. Creative Financing.** We create financing solutions that meet your business objectives. We also take a realistic approach, at acceptable risk levels, to investment in our own lease portfolio.

For all of these reasons—and because of the unique personal commitments of our people—we believe we can provide you with the finest service you have ever seen in the industry. Please call us at (313) 645-5353.

# Headquarters

505 North Woodward Ave.  
Suite 3400  
Bloomfield Hills, MI 48013  
(313) 645-5353

# Regional Offices

Mission Viejo, California  
(714) 582-2957

Grand Rapids, Michigan  
(616) 235-9700

Warrenton, Virginia  
(703) 549-4042



The Original Cast



# SYSTEMS & PERIPHERALS

## HARD TALK

James Connolly

### Fighting the current



Row, row, row your boat, gently down the stream. Merrily, merrily, merrily, life is but a dream.

How about rowing not-so-gently upstream with only one oar — and still being fairly merry? That is the situation in which some users of the IBM System/38 find themselves. They are happy with their machines, but life is getting complicated as they fight the current — IBM and its failure to outline a growth path for high-end System/38 users.

It is not a case of IBM not having such a path. Whether it is a good selection or a poor one, IBM is expected to announce the System/36 and 38 follow-on product, code-named Silverlake, next year. The complaint from System/38 users is that information about Silverlake has been taking a circuitous route — through analysts, the press or selected users — before being passed on second- or third-hand to the general System/38 community. That method is subject to the dangers of misinterpretation and wishful thinking.

Most System/38 users questioned recently said they assume

*Continued on page 71*

## Motorola 68030 finds support

General Automation announces system based on new chip; others to follow

BY JAMES CONNOLLY  
CW STAFF

ANAHEIM, Calif. — General Automation, Inc. recently became the first in what is expected to be a string of vendors to announce systems based on Motorola, Inc.'s 68030 microprocessor, which is Motorola's successor to its 68020 CPU chip.

A Motorola spokesman said General Automation is the first vendor to announce a system using the 68030 but that a group of OEMs and system integrators are expected to be on hand when Motorola officials next week make announcements related to the 68030. Motorola introduced the 68030 in September 1986 with claims that it would perform 8 million instructions per sec-

ond, which is double the capability of the 3-year-old 68020 and rival Intel Corp.'s 80386.

The General Automation Zebra 8830 is the new high-end product in General Automation's line of Pick Systems Pick-based business computers. The vendor claimed that the 8830 supports up to 256 users, which is twice the limit of its previous high-end product, the Zebra 7820.

According to General Automation Chairman Leonard N. Mackenzie, the 8830 not only is the company's first 68030-based system but also is the first General Automation system to use intelligent Motorola 68010-based terminal I/O controllers. That feature, which was designed to minimize data contention in configurations with large numbers of users, allows 64 us-

ers to be supported by each I/O subsystem.

The 8830 is available with up to 16M bytes of memory and features disk controllers with look-ahead cache memory and support for up to 3.28G bytes of disk storage.

The 8830 will be available to end users, OEMs and value-added resellers in January at prices ranging from \$215,000 to \$350,000, according to General Automation.

The 68020 is used principally in Unix-based systems. Major vendors selling 68020-based systems include Apple Computer, Inc.; Convergent Technologies, Inc.; NCR Corp.; Unisys Corp.; Harris Corp.; NEC Information Systems, Inc.; Apollo Computer, Inc.; and Sun Microsystems, Inc.

## Subsystem makes AT a workstation

BY STANLEY GIBSON  
CW STAFF

CUPERTINO, Calif. — Opus Systems recently announced a hardware and software subsystem that converts an IBM Personal Computer AT or compatible machine into a multiuser system or engineering workstation running Microsoft Corp. MS-DOS and Unix simultaneously.

The 220PM subsystem consists of a hardware board including the National Semiconductor Corp. 32332 processor and AT&T Unix System V, Release 3 with enhancements.

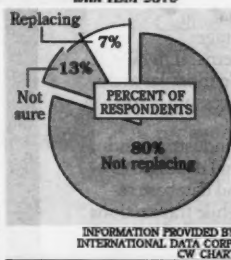
Offering 2 to 3 million instructions per second (MIPS) of processing power and 4M to 16M bytes of physical memory, the 32-bit system, embedded in a PC AT, was designed to run MS-DOS and Unix System V simultaneously.

Opus referred to its product as part of its Series 200 of Personal Mainframes. "We are trying to say we are taking ad-

*Continued on page 70*

## Data View

No substitute  
Survey of 500 MIS shops shows  
few will replace IBM System/36  
with IBM 9370



## Emulex adds 655M-byte disk

COSTA MESA, Calif. — Emulex Corp. recently heated up its competition with Digital Equipment Corp. and DEC-compatible disk makers by introducing a disk subsystem that Emulex claimed provides 1.7G bytes of storage per square foot.

The SM206, designed for use with DEC VAXs, is based on Emulex's Storage Module Interconnect and the recently announced Control Data Corp. 9720 EMD-850 Sabre IV 8-in. disk drive. According to Emulex, the drive is intended for applications in which capacity and per-

formance are critical.

Up to 12 of the 8-in. drives can be packaged in a single 19-in. cabinet to provide up to 7.8G bytes of formatted storage. The drives are compatible with DEC's Digital Storage Architecture, according to Emulex.

Each drive has a formatted capacity of 655M bytes, a 16-msec average seek time and a 2.46M byte/sec. transfer rate, said Emulex Vice-President for Storage Product Unit Jay O'Donald. The SM206 is scheduled for shipment in November at a list price of \$168,000.

## Inside

- IBC adds 68020-based multiuser PC. Page 70.
- Delphax rolls out ion printer with raster image processing. Page 71.
- Unisys unveils terminals for Unix, Uniscope. Page 73.

## ► IBM 3270 and System/54/56/38 Users:

# Our Printers Solve Problems That IBM Printers Can't.

► Since 1975, we have manufactured IBM 3270 and S/3X plug-compatible printers for over 1,000 organizations worldwide. Why do users prefer ISI? Mainly, because our printers have problem-solving capabilities not available with corresponding IBM models.

For example, with ISI printers, you can:

- Print continuous, multi-part forms without costly waste.
- Print bar codes and oversize label characters.
- Print up to 8 pages of letter-quality text per minute.
- Print IBM Programmed Symbols graphics in up to 7 colors.

Added features and all, our printers cost 15-30% less than their IBM counterparts.

Select from desktop dot matrix, laser, and letter-quality impact models, as well as floor-standing line printers. No need for boxes — our printers are fully integrated. Plus they're shop-floor durable, and feature onsite service nationwide.

For our free brochure, call 1-800-544-4072 (in Michigan, 313/769-5900). Or write.



**Interface Systems, Inc.**

5855 Interface Drive, Ann Arbor, MI 48103  
Tel.: 810-223-6058



► Our ISI 462 band line printer produces high-quality draft output at up to 720 lines per minute. It's available in IBM 3270 and S/3X plug-compatible models, each with an optional "quietized" cabinet.

## CULLINET INTRODUCES THE MOST POWERFUL SOFTWARE EVER DEVELOPED TO RUN PRODUCTION APPLICATIONS ON VAX SYSTEMS.

At Cullinet, we understand that time is money. Not just in the financial services industry, but in every segment of the worldwide economy. From funds transfer in banking, to order administration and inventory control in manufacturing. And systems for contract management and control in defense and funds accounting in government.

Each of these applications demands rapid and efficient transaction processing. To secure a competitive advantage within these markets, an organization must be able to manage an ever increasing volume of business as well as update and distribute information in real time - throughout the organization - with uncompromising data integrity and full recoverability.

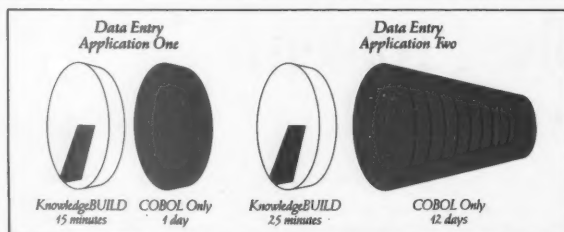
That's exactly what Cullinet has done. We've developed the first set of relational database management and productivity tools powerful and easy enough to take your VAX™ to the max. And versatile enough to create, develop and implement the sophisticated departmental applications required by today's high transaction, multi-user environments.

### MAXIMIZE PRODUCTION POWER WITH THE IDMS/SQL DATABASE.

IDMS/SQL™ is a true production-power, SQL-compatible relational database management system developed to take maximum advantage of Digital Equipment Corporation's family of VAX computer systems. IDMS/SQL combines the latest advances in database technology with a flexible modular architecture that is particularly well-suited to unattended distributed processing across multiple machines.

In addition to offering full support of ANSI-standard SQL, the industry-standard database language, IDMS/SQL is the first VMS™ based relational database to combine continuous system operation with automatic recovery and database restart. That means you can backup and restructure your database while transactions are updating it. And to ensure maximum data integrity, IDMS/SQL includes a wide range of security and administrative capabilities.

### MAXIMIZE APPLICATION DEVELOPMENT WITH KNOWLEDGEBUILD TOOLS.



*Application One:* Data entry and update form with features including multiple table access, pop-up field help, and data integrity checking.

*Application Two:* Data entry and update form with features of Application One plus repeating records and calculated fields.

# TAKES YOUR

# VAX CO THE AX.

At the heart of IDMS/SQL's comprehensive development environment is KnowledgeBUILD™, an easy-to-use set of integrated tools that maximizes development and maintenance productivity for both application developers and end-users.

KnowledgeBUILD allows developers to create, develop, and implement critical business applications in a non-procedural way. Using either VAX RMS™ files or IDMS/SQL for data storage, developers paint the user interface including screen and report layouts. KnowledgeBUILD then automatically translates these layouts into efficient COBOL, FORTRAN or BASIC programs, optimizing run-time performance. To provide end-users with the tools they need to access information, KnowledgeBUILD includes FastInfo, an easy-to-use forms-driven query and reporting utility.

## MAXIMIZE APPLICATION IMPACT WITH APPLICATION EXPERT.

Application Expert™ is Cullinet's unique expert system tool for embedding expert components in business applications and maximizing the development of discrete expert applications.

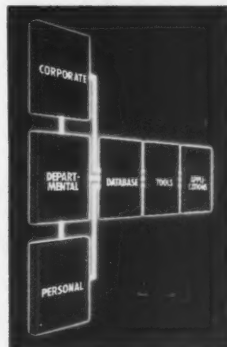
By providing an advanced development environment that enables users and MIS professionals to capture and maintain knowledge in the form of English language rules, Application Expert facilitates ease of implementation. An intelligent user interface makes information more accessible by guiding users through the decision-making process. Application Expert is the only knowledge-based expert system that incorporates voice-response technology to let you turn every telephone into a workstation.

## MAXIMIZE INTEGRATION WITH CULLINET'S 3X3 ARCHITECTURE.

Cullinet's 3x3 is much more than an architecture. It's a means of integrating all of your company's information resources. Our approach provides for the integration of three sets of software products – databases, development tools and applications – and their connectivity across three distinct computing environments – corporate mainframes, departmental systems and personal computers. It's working and working hard for more and more major corporations worldwide.

Cullinet's broad product line includes IBM® compatible software as well as software for Digital VAX systems and other departmental platforms. And our database products, productivity tools and fourth-generation business applications – including manufacturing, project management, distribution management, finance, banking and human resources – feature embeddable expert system technology, today.

Your VAX system provides an ideal environment in which to design, implement and maintain production applications. And only Cullinet can take it to the max. Our upcoming fall seminar series is the place to start. For more information, including a complete schedule of IDMS/SQL seminars, call us toll-free at 1-800-551-4555. Or write to Cullinet Software, Inc., 400 Blue Hill Drive, Westwood, MA 02090-2198.



### Cullinet®

An Information Technology Integrator  
For The 80s, 90s And Beyond.

Now available to VARs and OEMs.

## Subsystem

CONTINUED FROM PAGE 67

vanced technology and putting it in a PC form factor," said John Lundell, chairman of Opus.

The subsystems are to be sold to value-added resellers and systems integrators who will configure them with an AT for use as single-user engineering workstations or as multiuser systems supporting a maximum of 16 users in typical applications, according to the vendor.

Opus previously offered its 110PM, which is designed to work with an IBM PC XT or compatible or AT. A 220PM board may be swapped for the 110PM board in an AT in upgrading a 110PM system.

The 220PM more than doubles the throughput of the Model 110PM and improves floating-point calculation speeds, according to the vendor. Prior to the introduction of the 220PM, the price of the 110PM was cut by up to 48%, Opus said. Deliveries of three versions of the Model 220PM will begin immediately to OEMs, value-added resellers and systems integrators under volume discounts.

The 220PM-04 containing 4M bytes of random-access memory has a suggested list price of \$3,995. The 220PM-08, an 8M-byte version, lists at \$6,155. The 220PM-16, with 16M bytes of memory, lists at \$9,755. The prices include a one-to-two-user Unix license as well as Opus's real-time I/O executive and I/O device driver library.

## IBC offers Motorola 68020-based multiuser micro; I/O featured

BY STANLEY GIBSON  
CW STAFF

CHATSWORTH, Calif. — Integrated Business Computers, Inc. (IBC) recently added a multiuser microcomputer based on the Motorola, Inc. 68020 microprocessor to its line of multiuser systems.

Using a 16-MHz version of the 68020, the Ensign 682:100 is capable of supporting from 16 to 100 users with a per-user cost of \$484, according to IBC.

The key to the Ensign's multiuser per-

formance is its intelligent serial and disk controllers, said Randy Johnson, vice-president of marketing at IBC.

The controllers, called IBC's proprietary Memory Management Unit (MMU), can use up to four Motorola 68010 microprocessors and more than 1M byte of buffer memory for serial and disk overhead, leaving the host 68020 free to provide its full performance to as many as 100 users, Johnson said.

A basic Ensign 682:100 configuration consists of a 16-MHz 68020, a 50M-byte Winchester drive, a 1.6M-byte floppy disk drive, 16 serial ports, a parallel port, a slave 10-MHz 68010 processor and a 1M-byte memory disk serial I/O buffer.

The suggested retail price of the product is \$10,695.

A fully equipped Ensign 682:100 configuration supporting 100 users includes 24M bytes of random-access memory, 1.1G bytes of hard-disk storage, a 1.6M-byte floppy disk drive, 100 serial ports, four parallel ports, a Motorola 68881 floating point coprocessor, a 60M-byte streaming tape drive backup and AT&T's Unix System V operating system at a suggested retail price of \$85,290.

In 1986, IBC introduced the Ensign 386:100, a multiuser system using the Intel Corp. 80386 microprocessor. IBC will generally sell the Ensign 682:100 and the Ensign 386:100 to different value-added resellers, according to Johnson.

However, users who wish to run both 80386- and 68020-based systems may purchase from IBC a 68020 adapter board that can plug into its 80386-based product. "It is for people who use Unix and Xenix. It saves money for users who can use it instead of buying two systems," Johnson said.

He added that IBC plans to offer a 20-MHz version of the 386-based product within two to three months.

## The best MIS solution for human resources and payroll isn't software.



### It's a service.

Before you commit a major amount of people and money to payroll and personnel software such as ISI, MSA, M&D or the others, we suggest you invest a small amount of your time to investigate the better solution, ADP.

#### Service vs. Software.

We're the service solution to payroll and personnel automation and we're a lot more cost effective and flexible than you might think. Because while the cost of doing payroll in-house may seem to end with the cost of the software, in fact it is only the beginning.

#### The Hidden Costs of Doing It Yourself.

There's the hidden costs of maintaining and updating your current system. The time your people have to spend meeting the reporting needs of payroll and personnel. And the considerable burden on your computer and personnel resources for these non-strategic applications.

Which is why we think you'll find that the most cost-efficient, flexible, and accurate way to handle payroll processing and human resources reporting isn't with your computers and personnel resources—it's with ours.

#### Integration and Flexibility.

We're the nation's largest personnel payroll service organization. And we can fully integrate all human resources and payroll data for convenient access and timely reporting, whether you're in a centralized or decentralized environment. All the while sparing you the hassle, lead time and pressures involved in getting and keeping a software system up and running.

#### We're at Your Service.

That's why, when it comes to certain MIS problems, the best solution isn't software, it's a service. The kind of

service you can only get from ADP's National Accounts Division, which provides personnel/payroll services to the Fortune 1000.

Find out more about how our services can help you.  
**Call 1 800 441-1313.**

#### I want to find out more about ADP's National Accounts Division's services.

(Mr./Ms.)  
Name \_\_\_\_\_  
Title \_\_\_\_\_ Telephone Number \_\_\_\_\_  
Company \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_ Zip Code \_\_\_\_\_  
No. of employees at this location \_\_\_\_\_ entire company \_\_\_\_\_  
Do you use an IBM ☐ PC ☐ PC XT ☐ PC AT ☐ Other \_\_\_\_\_  
ADP client? Yes ☐ Which services \_\_\_\_\_ No ☐  
Mail to: ADP Response Center  
335 Bishop Hollow Road  
Newtown Square, PA 19073

1076



We bring personnel and payroll together.

### Standards/Guidelines For Systems Development Seminar

Question? Do you have complete Standards/Guidelines (including PC's)? Could your DP dept. handle CASE-Right Now?

Good Standards/Guidelines are a critical prerequisite for any efficiently run DP operation. They are essential for CASE.

Intra-Systems' Standards and Guidelines seminar will show you how to maximize the performance and credibility of your computerized systems with effective Standards/Guidelines.

For information and to register call (405) 556-0944. Cost for the one-day seminar and materials is \$195.00.

St. Louis 10/20 Kansas City 10/22 Houston 10/28 New York City 11/3 Minneapolis 11/10 Washington DC 11/17

Seattle 11/24

Coming in 1988  
M.I.S. Planning

### Intra-Systems Inc.

Data Processing Resource Management  
Seminars/Consulting/Publications  
We Are The Solution  
405/556-0944



# Delphax ion printer boasts raster processing

BY SUZANNE WEIXEL  
CW STAFF

RANDOLPH, Mass. — Delphax Systems, Inc., a manufacturer of nonimpact printing systems utilizing its ion printing process, recently announced the Delphax S3000G, an ion printer with a raster image processing subsystem.

The Delphax S3000G is a 30 page/min. printer that produces output at a matrix density of 300 by 300 dot/in. resolution. It is supported by a 3½-in. floppy disk drive that can be used to download fonts or emulations.

According to Naomi Luft, senior re-

search analyst at Datek Information Services, the raster image processing controller is significant because it opens up ion printer technology to different applications.

"Traditionally, Delphax 30 page/min. machines have been used for internal documents and word processing applications. By offering this controller, Delphax can become involved in markets such as desktop publishing and general correspondence," Luft said.

"Since the print quality is a fair amount different from what users are accustomed to, it's mostly a matter of whether the market is ready to accept ion printing for

different things," she added.

The raster image processing controller is located in a separate printed-circuit board within the printer enclosure. It provides emulation for the Hewlett-Packard Co. Laserjet Plus and Diablo 630 printer command languages. Standard interfaces for the S3000G include those from Centronics Data Computer Corp. and Data-products Corp. Delphax also offers custom interfaces for specific applications requirements.

The raster image processing motherboard contains an Intel Corp. 80286 microprocessor for local memory and self-diagnostic commands in addition to all-

points addressability.

Company spokesmen said graphic enhancements designed to extend the HP Laserjet's capabilities include the ability to download up to six forms and create page designs with line, arc and circle-draw commands.

The S3000G ion printer is rated at a monthly duty cycle of 250,000 pages. Dual 500-sheet feeder and stacker bins are standard; 2,000-sheet feeder and stackers are available.

Delphax markets the S3000G ion printer to OEMs, but spokesmen estimated that end-user prices will range from \$20,000 to \$25,000. An upgrade kit for the S3000L ion printer, Delphax's earlier 30 page/min. model, is also available, the vendor said.

## Fighting

CONTINUED FROM PAGE 67

Silverlake will arrive next year and that their software will be supported. But few are confident that the early Silverlake models will exceed the power of the current high-end System/38 Model 700 or that enhancements to the Model 700 will be available to support those high-end users until high-performance Silverlake models are delivered.

The users also expressed concern about just how compatible their software will be with Silverlake and IBM's priorities. One user said he had heard through the grapevine that Silverlake will include RPG II as a standard feature and that RPG III will be available at additional cost. That might sit well with System/36 customers who have been using RPG II, but it obviously would not please System/38 users who run RPG III. Is that report true? The user has been unable to find out from IBM.

The irony of the System/38 users' situation is that they may be the most loyal of all computer user communities. MIS managers at System/38 sites have made a commitment to a non-mainstream architecture, a technology based from the start on the now-popular concepts of data base management and ease of programming. By IBM standards, the System/38 has never been a market smash hit, with a U.S. installed base of about 11,500 systems. But that number represents thousands of firms that have stuck with the System/38 through years of speculation about whether IBM would abandon them. It is not surprising that those users voicing concern are those with one, two or three CPUs, which is fairly typical of the System/38 user base. Also, few System/38 users get into the nondisclosure briefings that IBM gives to users of its 3090 mainframes.

However, is there any reason to believe that knowing the direction of IBM's mid-range strategy is any less important to a manager who uses a \$250,000 System/38 as a host system than knowing the IBM mainframe strategy is to a manager running an \$8 million 3090? Certainly not if both managers worry about things such as capacity, connectivity, compatibility and obsolescence.

If for no reason other than their loyalty, System/38 users deserve more than vague promises of something special coming a year down the road.

Connolly is *Computerworld's* senior editor, systems & peripherals.

## With Lawson business application software... Superheroes like you wear PINSTRIPE® suits

Choosing business application software can be a heroic effort. Your end-users want super, easy-to-use application features. Your data processing staff insist on simple installation, clean code and software that's easily maintainable.

Your boss is looking at the bottom line. He wants a tool to increase productivity. To lead to better business decisions. And make him look good.

A Herculean order.

But so easily attainable. Lawson provides sensible PINSTRIPE® business software for your accounting, human resources and procurement/distribution management applications. On your IBM Mainframe, IBM System/38 or Unisys (Burroughs) equipment.

### Full-featured design.

PINSTRIPE® application software is designed by people like accountants, CPAs and human resource professionals on our staff. So your end-users get all the easy-to-use features they need.

And features they never thought they could get. Until they asked us. In the last four years, we've incorporated 84 percent of all end-user suggested enhancements into our software packages.

PINSTRIPE® packages are tightly integrated with each other by design, too—for more efficient use of company data. Building powerful systems for business decision-makers.

### New software technology.

Lawson offers the best in software technology. Our code is fresh. Straightforward. For simple installation and maintenance. Matter of fact, our packages are completely updated and rewritten about every three years. So you're not "patched" to death with a cumbersome and unwieldy system. Instead, you take full advantage of industry advancements in both hardware and software technology. For improved productivity.

And we offer new systems software tools to simplify and streamline program operation in your hardware environment. Easy install, for instance, speeds installation—up to ten times. Saving time for both MIS and end-users.



### Service and support—whatever it takes.

And it's all backed by service and support that set a new benchmark for the industry. With excellent standard service and maintenance that gets you up and running fast with your PINSTRIPE® package. Including your own personal client service representative. Who will be familiar with your particular application—and the package.

Plus a full range of optional Support-Plus services. Like implementation consulting, data conversion, application and technical consulting. A post-sale audit to make sure you're fully—and profitably—implemented. And more.

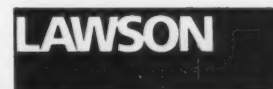
If you have some unique needs, we'll adjust our package to fit. And guarantee our work. Rather do your own modifications? You'll find our well-structured code easy to modify. And we'll still support the rest of the package. Other business application software companies won't.

### Be a Superhero—with Lawson PINSTRIPE® software.

Feature-rich application technology. State-of-the-art software technology. Plus service and support that set a new industry standard. At Lawson, we put it all together.

Call us toll free at 1-800-672-0200, and we'll send you our Executive Overview. Plus our useful booklet on how to select application software.

So you can be the superhero in your company.



...WHATEVER IT TAKES!

Lawson Associates Inc. provides a full range of richly featured PINSTRIPE® business application software packages. For IBM System/38, IBM Mainframe and Unisys (Burroughs) hardware environments. Available in the U.S., Canada and overseas.

### Accounting

- General Ledger • Accounts Payable
- Accounts Receivable • Fixed Assets
- Project Accounting

### Human Resources

- Payroll • Personnel • Benefits

### Distribution/Procurement Management

- Order Entry • Inventory Control
- Purchase Order

LAWSON ASSOCIATES INC.  
2021 East Hennepin Ave., Minneapolis, MN 55413  
1-800-672-0200

## NEW PRODUCTS

## Turnkey systems

A computer-based proprietary monitoring system said to combine fire, security and access control, has been introduced by ADT, Inc.

The system, called the **Centrascan 300**, features a desktop CPU that integrates such software applications as burglar and fire alarms, card access, watchman's tour, closed-circuit television and building management.

Available options include color graphics, map matrix status display, a remote terminal unit that functions as a communications interface between various points of protection and the Centrascan console, a second operator terminal and an uninterruptible power supply.

The Centrascan 300 is priced from \$34,000.

ADT, 300 Interpace Pkwy., Parsippany, N.J. 07054. 201-316-1000.

## Processors

A backplane central services module has been announced by Mupac Corp.

The backplane plugs into the back of a Mupac IPSB backplane to allow the system designer to use slot zero. It provides such basic Intel Corp. Multibus II system functions as generating synchronous bus clocks for all Multibus II Parallel System Bus agents, monitoring time-out exceptions and asserting time-out signals when detected, assigning arbitration and card-slot IDs to each agent during reset of the

system and automatic resetting. The backplane is priced at \$450.

Mupac, 10 Mupac Drive, Brockton, Mass. 02401. 617-588-6110.

## CAD/CAM/CAE

A Unix-based turnkey engineering workstation has been announced by Graftek, Inc., a Unisys Corp. company.

The **Model 1450** uses Motorola, Inc. 68020 processor technology and includes a Motorola 68881 floating-point processor. The workstation is capable of functioning as a stand-alone unit or can be linked to form a network sharing such resources as data files, printers and plotters.

The Model 1450 incorporates an integrated graphics display offering up to 256 simultaneous colors, on-screen menu highlight selection, dynamic pan and zoom and three-dimensional rotation.

Software includes the vendor's GMS modeling software and such applications as numerical control, finite-element modeling, plastic injection mold design and analysis and relational data base management.

The Model 1450 is priced from about \$50,000.

Graftek, P.O. Box 9014, 2970 Wilderness Place, Boulder, Colo. 80301. 303-449-1138.

## Data storage

An optical-disk controller board designed for Q-bus systems has been announced by Qualogy, Inc.

The **QLC-1000** optical controller, said to be completely compatible with Digital Equipment Corp. hardware and software, looks like a TK-50 tape drive to the Q-bus system using Tape Mass Storage Control Protocol.

Throughput is said to reach up to 250K byte/sec. The controller works with both 5¼- and 12-in. optical disks.

The QLC-1000 is a dual-wide-Q-bus board that uses a proprietary gate array, a NEC Corp. V50 microprocessor and 64K bytes of random-access memory cache. It costs \$1,995.

Qualogy, 2241 Lundy Ave.,

San Jose, Calif. 95131. 408-434-5200.

An enhanced small device interface (ESDI) disk controller for VME-based systems has been introduced by Xylogics, Inc.

The board, called the **Xylogics 714**, is said to be capable of controlling four industry-standard or ESDI disk drives with configurations set by user software. Data transfer rates from 625 byte/sec. at 5 MHz to more than 1.8M byte/sec. are supported.

The controller features a 48-bit error-correction code, 32-bit direct-memory access and a

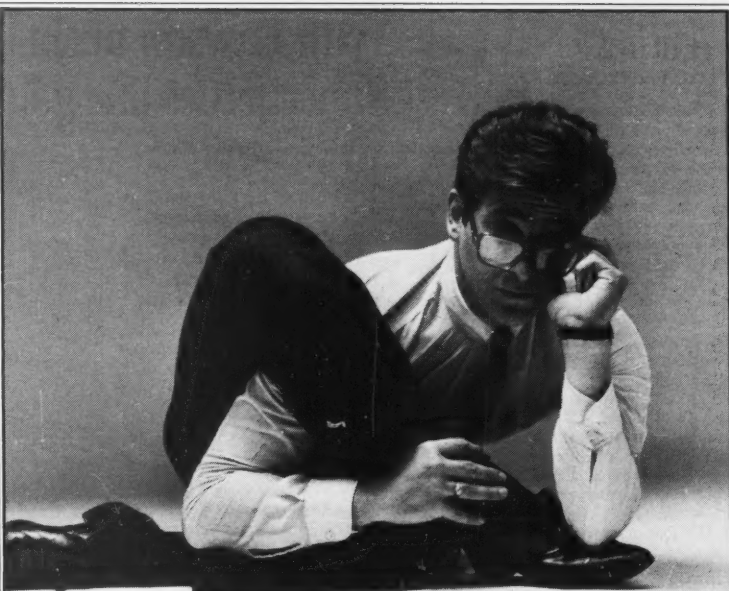
28K-byte first-in first-out data buffer.

The Xylogics 714 is priced at \$2,695.

Xylogics, 53 Third Ave., Burlington, Mass. 01803. 617-272-8140.

A 500M-byte hard-disk subsystem for Hewlett-Packard Co. HP 3000 computer systems has been announced by Bering Industries, Inc.

The **Model 5050** features an average transfer rate of 800K byte/sec. and an access time of 26 msec. It is said to be 100% compatible with HP computers using CS/80 and SS/80 com-



## HOW TO GET SPECIAL PROJECTS DONE WITHOUT TYING YOUR STAFF IN KNOTS.

Now you can get your special data processing projects completed quickly, accurately and cost-effectively without disrupting the workflow of your organization. The solution is project-oriented specialists from Accountemps.

Accountemps data processing professionals are slightly over-qualified. Orientation is short and simple. They fit in with your permanent staff and have the expertise to complete special projects knowledgeably and skillfully. You supervise them just like you do

your own people. And you don't have to divert your permanent systems analysts, programmers, operators, and data entry personnel from their regular assignments.

The result is that you meet your deadlines, get a professionally done job and save time and money.

Call us the next time you have a special project. We'll send you a data processing specialist, or a team of specialists to pitch in for a day, a week, a month or longer.

Rely on Accountemps. You'll be glad you did.

**accountemps.**  
data processing  
Rent an Expert.

© 1986, Robert Half International Inc.  
Offices independently owned and operated.

## FORGET ABOUT SALES TAX UPDATES.

**VERTEX DOES THEM FOR YOU!**

Get up-to-date sales tax rates for all state and local jurisdictions on magnetic tape, every month. Includes access, computation and print programs that can help your implementation.

**CALL 215-687-9060**

**Vertex Systems Inc.**  
998 Old Eagle School Road, Wayne, PA 19087

mand sets. Self-diagnostics are included in the disk controller to automatically isolate failures.

The Model 5050 is priced at \$12,500.

Bering Industries, 280 Technology Circle, Scotts Valley, Calif. 95066. 408-438-8779.

## Terminals

Three terminals for Uniscop and Unix operating environments have been announced by Unisys Corp.

Two of the terminals, the SVT 1125 and the SVT 1126, were designed for use with Unisys's OS-1100 mainframe and support the Uniscop protocol. The SVT 1125 communicates over packet-switched public data networks. The SVT 1126 communicates over twisted-pair wiring. Both feature 14-in. monochrome displays capable of 80- or 132-col. viewing modes.

The UVT 1224 is an ANSI X3.64 standard terminal featuring a 14-in. monochrome display offering 24 lines by 80- or 132-col. It is compatible with Digital Equipment Corp. VT52, VT100 and VT220 terminals.

The SVT 1125 and SVT 1126 each cost \$895. The UVT 1224 costs \$695 or \$795, depending on the type of keyboard. Unisys, P.O. Box 500, Blue Bell, Pa. 19424. 215-542-2240.

Identix, Inc. has reduced the price of its IDX-10 finger scanning terminal.

The IDX-10 is a compact terminal that contains a patented finger scanner and proprietary software for identity verification.

Up to 63 terminals can be connected to a specially configured IBM Personal System/2

host computer by a local-area network.

The IDX-10 was designed for such security applications as controlling access to facilities or computer data and authorizing business transactions such as electronic funds transfer, the vendor said.

The single-quantity price of the IDX-10 was reduced from \$7,500 to \$5,000.

Identix, Palo Alto, Calif. 415-858-1011.

**Courier Information Systems**, an Alcatel Business Systems company, has expanded its IBM 3270-compatible product line with three display terminals designed for data entry and interactive processing.

The Courier 9291 G green, 9291 A amber and 9291 AG amber-gold displays function as plug-compatible replacements for IBM 3191 A and B display terminals. They feature ergonomic, 12-in. tilt-and-swivel monitors and nonglare, 1,920-char. screens.

Other features include variable underlining, reveal mode, blinking fields, a row and column indicator, autoblack, security key lock and single-stroke clear.

The terminals cost \$1,235 each with a one-year warranty and \$1,295 each with a three-year warranty.

Courier Information Systems, 1515 W. 14th St., Tempe, Ariz. 85281. 602-894-7000.

A 12-in. monochrome monitor designed specifically for use by stock and currency traders has been introduced by **Electrohome Ltd.**

Called the EVM-1220SL, the 12-in. monitor measures 11.3 in. wide and 12 1/2 in. deep.

The actual footprint is 142.4 sq in.

The small size enables installation of up to six units, instead of five, on a trader's desk.

Resolution is 650 by 488 pixels, and the horizontal scan rate adjusts automatically to any signal between 15.75 and 25 KHz.

There is a choice of an anti-glare or polished tube with white, green or amber phosphors. Sixteen discernible levels of black, gray and white can be displayed.

Pricing ranges from \$677 to \$777.

Electrohome, 809 Wellington St. N., Kitchener, Ont., Canada N2G 4J6. 519-744-7111.

A point-of-sale terminal family designed for the specialty store market has been announced by **NCR Corp.**

The NCR Specialty Store System is programmed in Basic. According to the vendor, one terminal can be used alone, or up to 32 terminals can be linked together.

The family consists of four models: the NCR 2157 and NCR 2155 are primary terminals that feature file sharing, and the NCR 2156 and NCR 2154 are secondary terminals that can share the resources of the primary terminal.

A basic terminal is priced at \$4,600.

NCR, 1700 S. Patterson Blvd., Dayton, Ohio 45479. 513-445-4169.

## Printers/Plotters

**MAI Basic Four, Inc.** has introduced the PT-4215 dot matrix, the PT-4216 letter-quality and the PT-4220 and PT-4221 band printers.

The PT-4215 is a 24-wire dot matrix printer. Continuous forms are automatically loaded and unloaded. Single sheets can be loaded without removing the continuous forms. It costs \$1,495.

The PT-4216 desktop daisy-wheel printer reportedly can accommodate single sheets and multipart forms up to 15 in. wide. It costs \$845 with a parallel interface and \$895 with both parallel and serial interfaces.

The PT-4220 and PT-4221 are band printers featuring six-digit display controls. They can accommodate up to six-part forms.

The PT-4220 is rated at 600 line/min and the PT-4221 at 1,200 line/min.

The PT-4220 costs \$8,495. The PT-4221 costs \$19,995.

MAI Basic Four, 14101 Myford Road, Tustin, Calif. 92680. 714-731-5100.

An 8 page/min laser printer designed for use with IBM System/34, 36 and 38 minicomputers has been announced by **Acom Computer, Inc.**

The Treasurer LX3808

printer is said to emulate the IBM 5219 and 5225 printers when addressing the IBM minicomputers; it emulates the Hewlett-Packard Co. Laserjet when addressing personal computers.

Features include a built-in sheet and envelope feeder as well as support for one minicomputer and up to three personal computers. Software compatibility is provided for such programs as Lotus Development Corp.'s 1-2-3, Ashton-Tate's Dbase III and Microsoft Corp.'s Word.

The Treasurer LX3808 is priced at \$4,495.

Acom Computer, 3534 Atlantic Ave., Long Beach, Calif. 90807. 213-424-986.

**Datasouth Computer Corp.** has announced a price reduction on its TX 5180 printer designed for use with the IBM System/34, 36 and 38 minicomputers.

The TX 5180 is said to print LAC/APF graphics and to provide multiple pitch options. It is also compatible with the IBM Displaywrite/36 and Text Management word processing programs.

The TX 5180 is plug-compatible with the IBM minicomputers and features a parallel interface for ASCII computers as well.

Pricing for the TX 5180 has been reduced from \$2,995 to \$1,995.

Datasouth, P.O. Box 240947, Charlotte, N.C. 28224. 704-523-8500.

## Input devices

**Eastman Kodak Co.** has introduced the **Kodak Ektaprint 1530 scanner** designed for use with its Kodak Ektaprint elec-

tronic publishing system.

The 1530 scanner, which is driven by proprietary software, allows cropping and manipulating images. It also provides a 75 dot/in. lower resolution preview scan for developing rough layouts.

Images can be scaled and adjusted by the scanner itself.

Available options include six dithering screens and the ability to mirror or reverse images. Users are also able to divide images in order to apply image-capture techniques to individual segments.

The Kodak Ektaprint 1530 scanner starts at \$6,000.

Eastman Kodak, 343 State St., Rochester, N.Y. 14650. 716-724-1336.

A computer system said to simplify the entry of base maps into an electronic data base for revision, printout and storage has been announced by **Xerox Corp.**

The Xerox Pro Scan System allows operators to use a scanner to enter plats in raster form. Additions and deletions to the record are then entered as vector data, which can be indexed and manipulated electronically.

According to the vendor, a D-size 36- by 48-in. document can be scanned into the system in about 45 sec.

The system includes a Xerox 2285 19-in. color workstation, Unix-based Pro Scan software, a high-resolution scanner and an electrostatic plotter.

A fully configured system, including training for one operator, costs about \$125,000.

Xerox, EDDS, P.O. Box 2000, Leesburg, Va. 22075. 800-832-6979.

## PROQ-CICS (TM)

An on-line program development tool.

by Proquutil Inc.

### PROFESSIONAL UTILITIES

**PROQ-CICS** offers a solution to rapidly escalating programming costs and to the scarcity of good on-line programmers. In effect **PROQ-CICS**, a PC-based program, acts as your on-line programmer.

The operator simply "paints" the screen, supplies the characteristics of the fields, and commands the program to generate the code.

**PROQ-CICS** generates the BMS map and the COBOL program necessary to SEND and RECEIVE the map.

Existing BMS maps can be read by **PROQ-CICS** and easily maintained and modified.

WITH **PROQ-CICS** JUST A FEW KEYSTROKES ON A PC, AND ONLY A FEW MINUTES WILL COMPLETE THESE TASKS, WITH CONVENTIONAL METHODS, EVEN AN EXPERIENCED PROGRAMMER WILL REQUIRE QUITE A FEW HOURS TO DO THE SAME WORK.

ORDER YOUR SITE LICENSE FROM PROQUUTIL INC.;

Aetna Centre, 145 King Street W.  
Suite 1002  
Toronto, Ont. M5H 3X6  
(416) 360-7939  
Telex: 06-218177  
Fax: (416) 367-1954

\*CICS and BMS are trade marks of IBM corporation. PROQ-CICS is a trade mark of PROQUUTIL INC.

## FORGET ABOUT PAYROLL TAX UPDATES.




**VERTEX DOES THEM FOR YOU!**

Get up-to-date Federal, state, and local payroll tax requirements on magnetic tape, as changes occur. Complete with all access and computation modules for maintenance-free operation.

**CALL 215-687-9060**

**Vertex Systems Inc.**  
998 Old Eagle School Road, Wayne, PA 19087





# **COBOL reengineering reduced Joan's maintenance duties. Now she's into development.**

And a lot happier with her job.

One of the problems solved by computer aided software engineering (CASE) tools is the need to get programming superstars out of maintenance and back to application development. Catalyst products are designed to help MIS professionals coping with COBOL problems in IBM, Unisys, or Honeywell-Bull environments. They include the ability to perform software quality analysis (Pathvu), automate the restructuring and enhancing of COBOL code (Retrofit), and assist with Assembler to COBOL conversions (ReACT).

If you're concerned with the amount of resources being consumed by maintenance, the need to extend the life of vital operational systems, or constant user demands for new applications, then you need a partnership with the productivity tools of Catalyst.

For additional information on Catalyst's products, please call today: 800-323-3059, or contact Director of Software Marketing, Catalyst, Peat Marwick Plaza, 303 E. Wacker Drive, Chicago, IL 60601.

## **CATALYST**

An Information Technology Firm of Peat Marwick

### **800-323-3059**



# IN DEPTH

## What threatens mainframe computing?

*Only the culture still requires 'serious computing' to be run on a central machine*

BY FRED VISKOVICH

**I**s the mainframe dead? The answer is no, the mainframe is not dead. Not now. But it is dying, and the implications of its inevitable death are profound and far-reaching.

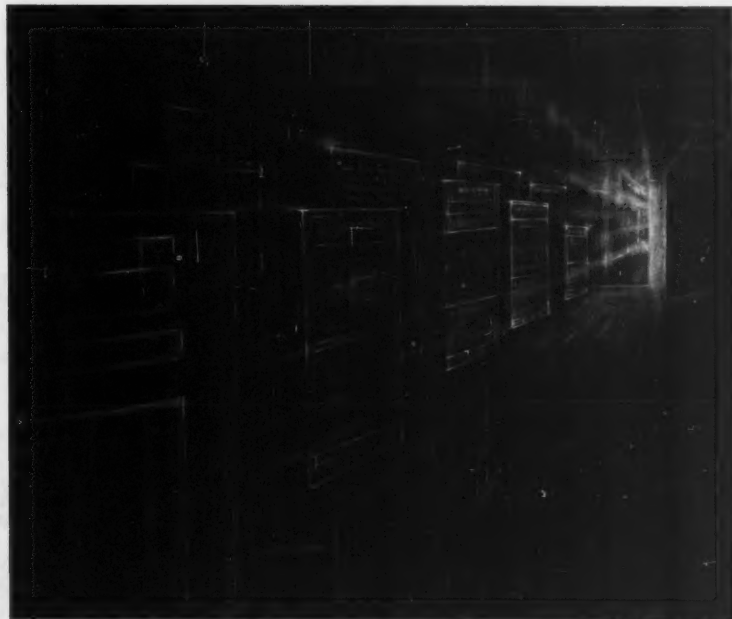
As with any recognition of mortality, there are phases of denial and rejection to pass through before acceptance finally comes about. For example, the recently introduced IBM Personal System/2 products have been described as a way to reintegrate personal computing and at the same time invigorate IBM's mainframe business. But they are not. They will only hasten the death of the mainframe, a process that was given significant impetus by the introduction of the IBM Personal Computer in August 1981.

The PS/2 will further demonstrate the superiority of a wide range of technologies, from non-mainframe operating systems to user interfaces to networking.

The PS/2 is an indication that IBM realizes the mainframe is vulnerable and approaching an evolutionary dead end. Talk of PS/2 mainframe connectivity is simply part of a tactical transition plan that protects customer investment, defends against computing chaos and preserves the expected profitability of America's fourth largest industrial corporation.

Before we further consider its demise, it is important to clarify what we mean by "mainframe."

Viskovich is a manager in the information systems group at Coopers & Lybrand in Philadelphia.



MICHAEL WINTERBAUER

When we say "mainframe," we refer not only to a class of computing machinery but, more important, to a corporate computing technology paradigm.

In his seminal work on the philosophy of science, *The Structure of Scientific Revolutions* (University of Chicago Press, 1962), Thomas S. Kuhn defined "paradigm" as "universally recognized scientific achievements that for a time provide model problems and solutions to a community of practitioners."

Thus, when we say "mainframe," we designate a paradigm, an idea that represents the current orthodoxy of just how serious, responsible computing should be carried out. In our idea of the mainframe, it is as much a creature of corporate culture and the organizational chart as it is electronics and integrated circuits.

This distinction between idea and object is significant. It is the mainframe's role as corporate information processing paradigm that justifies its existence

and prolongs its life — not technical demands for computing capability that cannot be satisfied by other means.

### Control of computing

Corporate culture dictates that computing as a valuable, enterprisewide activity be directed through the established command-and-control apparatus of the corporation. Examples of such systems include airline reservations, shop floor control, production scheduling, automated teller machines, electronic

- Mainframe paradigm grows obsolete
- Corporations' need for central control fades
- In crisis, mainframers rally around

funds transfer, credit validation, sales order entry, financial information reporting, payroll, materials management, inventory control, accounts payable and receivable, billing and customer information.

In this scenario, the MIS organization is the corporate command-and-control unit directing serious computing. This includes computer operations, programming and automated information archival. Historically, the MIS organization had one computer to deal with: the mainframe. Consequently, the very concept of serious computing became intimately linked with the mainframe.

However, it is important to realize that it is corporate culture, not the nature of the processing itself, that promotes the need to do all serious computing in one mainframe computer.

The millions of instructions per second (MIPS) only have to be in one place so that the perceived span of control is not overextended. MIPS do not have to be in one place to handle high-volume transaction processing or achieve subsecond response time.

The mainframe is synonymous with this high-volume computing requirement only when the corporation's generalized management philosophy and control sanctions uncritically extend to computer systems management.

#### Mainframe problems

Along with the corporate idea that central mainframes housed in a computer room are the only way certain applications can be developed are a number of broad-based problems, including applications backlog, performance reliability, capacity planning and chargeback.

Each of these problems contributes in its own way to the impending death of the mainframe.

The most notorious mainframe problem is the application backlog. In some cases, development work is complex by its very nature and should not be attempted without painstaking review and caution. There are also special barriers to rapid development in a mainframe environment, namely division of labor, low-level interfaces and testing.

In terms of division of labor, there are simply not enough qualified, competent mainframers. The support for a mainframe environment requires a fairly precise division of labor. In the past, managers, programmers, operators, production control staff, tape librarians and other support personnel were required. Today, we also need data modelers, analysts and administrators, data communications and networking specialists, information center managers and application source coders. We need individuals with integration talent, enterprise knowledge and the interpersonal skills to facilitate the corporation's common interests.

This increased specialization diminishes the available labor pool relative to demand, driving up costs and contributing to destabilizing competition for resources. Anyone who knows anything is considered an expert and is coveted by the competition, even if possessing a relatively shallow knowledge of complex and robust software.

The situation is not improving. At the same time personal computers are being made mandatory for students, colleges are experiencing declining enrollments in MIS programs. Finally, on-the-job training is stifled in the large, complex mainframe environment. Trainees can hardly

be given access to play with the mainframe.

In short, development cannot be accomplished rapidly because there is no one there to develop.

#### Low-level interfaces

When someone is there, even the best developer is hampered by poor tools. Over the years, this has been exacerbated by an obstinate commitment to "absurdly low-level" interfaces to application development facilities, to borrow E. F. Codd's phrase.

There has been some relief with fourth-generation language products, but this is largely too little, too late in terms of saving the mainframe.

For one thing, the productivity gains of

fourth-generation languages are reduced by the even more appalling paucity of fourth-generation practitioners, questionable performance and the largely idiosyncratic nature of the proprietary fourth-generation languages. In addition, even the best mainframe interfaces pale next to those offered on PCs.

Once a developer masters the interfaces, he must still negotiate formidable test environments: *Mytesting* can imperil *your* production and vice versa. This is primarily because one application shares the same hardware and the same set of systems-level software with many other applications in a single-image mainframe processor that is not nonstop. Defects in a single application can knock out the multiple application support provided by

"condominium software" such as IBM's CICS transaction manager and data communications monitor.

Testing has to be quarantined from production or, worse still, production facilities will be polluted with test transactions and facsimile data. Introducing multiple production copies of the transaction manager software provides some relief, as does the creation of virtual test machines, but at the expense of a more convoluted production environment. In the end, there is only a physical machine image that must be managed.

During and after testing — to be consistent with mainframe division of labor — business applications programmers must coordinate with systems programmers, who appropriately configure



IF YOU NEED TO KNOW WHO, WHAT, W

## BASIS®

Text Information Management System

BASIS was the first software system developed specifically for the storage and retrieval of large volumes of textual information. Today, with over 800 installations worldwide, BASIS remains the ultimate Text Information Management System (TIMS) available. Anywhere.

**Design flexibility makes BASIS software the ideal TIMS for diverse information management needs.**

From the boardroom, to the newsroom, BASIS' modular design offers flexibility in tailoring the application to the need. Which is why BASIS has helped automate corporate and technical libraries, research and development projects, law offices, government departments and agencies, financial and insurance companies, publishing concerns, educational institutions, manufacturing companies, and primary resource industries.

In fact, there really isn't much BASIS can't do when it comes to text information management. BASIS' unique, powerful, but efficient design is used and respected throughout the world.



**BASIS ENABLES TEXT AND DATA RETRIEVAL FROM A GROWING WORLD OF INFORMATION. SIMPLY. QUICKLY. EFFICIENTLY.**

**BASIS is designed to keep pace with your world of information, and, without the constraint of hardware dependence.**

Because BASIS is portable, your applications can run on many computers, minimizing your hardware dependency as applications increase in size...an important consideration when you are evaluating software for your text information management needs.

**As sophisticated as BASIS may seem, it remains a system that is simple to use.**

Fast, efficient information retrieval is possible in even the largest databases. BASIS uses "fast path" indexing techniques, providing a simple, yet powerful query facility that makes complex searching easy. Novice and casual users may retrieve information and generate reports using menus and simplified command statements. Advanced users may compose freeform query statements and generate ad hoc reports using the English-like query and data manipulation language. BASIS' help facility operates at three levels of expertise—beginner, advanced and expert so you always have immediate access to assistance.

the above applications support software. Often, a separate systems acceptance group performs final production testing and further coordinates a production control group that moves final draft code into production libraries.

All of the preceding adds an enormous amount of time to the application development cycle. In many cases, testing is given short shrift in a desperate effort to accelerate application development.

#### Reliable performance

The continued attempt to provide a safe proving ground for software essentially divorces such testing from the final production environment — eventually to the detriment of application performance.

The performance profiles specified by

**A**PPPLICATIONS are more often considered failures by virtue of bad performance than because they lack comprehensive features or a slick user interface. Ask the New Jersey Division of Motor Vehicles.

end users — the preferred analysts — early in the development life cycle are terribly difficult to achieve in the mainframe environment.

End users are often naive about, if not completely oblivious to, the capabilities of the underlying technical environment. Even business application programmers cannot easily predict the effect new production systems can have on old produc-

tion systems. Again, as a result of division of labor, they are largely unaware of overall system contention and of what natural avenues exist for achieving higher performance through systems software features and tuning.

Systems programmers, on the other hand, are notoriously unsympathetic to using a mainframe for much more than running the operating system.

In a best-case scenario, a technically enlightened designer is still faced with the fact that the exact impact of new programs on the simultaneous operation of old ones requires elaborate modeling. Such modeling must take into account transaction volume and variation, processor speeds, instruction mix, interruptions, disk access, communications delays and hundreds of smaller scale issues. This kind of modeling is really not done today, and, therefore, the true impact a new system has on the others can only be assessed at a gross level.

The risk ramifications of this can be critical. Applications are more often considered failures by virtue of bad performance than because they lack comprehensive features or a slick user interface. Ask the New Jersey Division of Motor Vehicles. No one could simply model the operation of New Jersey's latest registration system and then competently predict and avert the now infamous system start-up paralysis.

#### Capacity planning

In the absence of modeling, the amount of mainframe power needed to operate a new application in a satisfactory manner is still a matter for informed conjecture and professional gut check.

Furthermore, the intended system benefits might not justify adding the next marginal increment of computer power. After all, we buy additional instructions per second by the millions, not one by one. The street-smart MIS executive buys mainframe power with a substantial slush factor, builds the new application, measures impact and then orders additional slush factor as soon as the next mainframe model upgrade is available.

In practice, this works to a certain extent. But the imprecision of slush factor-based capacity planning can often result in only subhour response time when subminute response time is required. It can also result in spending good money on unnecessary hardware capacity.

Despite the potential sophistication of capacity planning in large, well-endowed shops, formal empirical capacity planning is not practiced by the majority of data processing organizations. At best, it is practiced for them by hardware vendors.

#### Chargeback

The cost of mainframe operations is usually applied to end-user organizations through chargeback algorithms. Chargeback and the computing utility's rate-making are often no more warmly received than the rate-making of its local electric and gas counterpart.

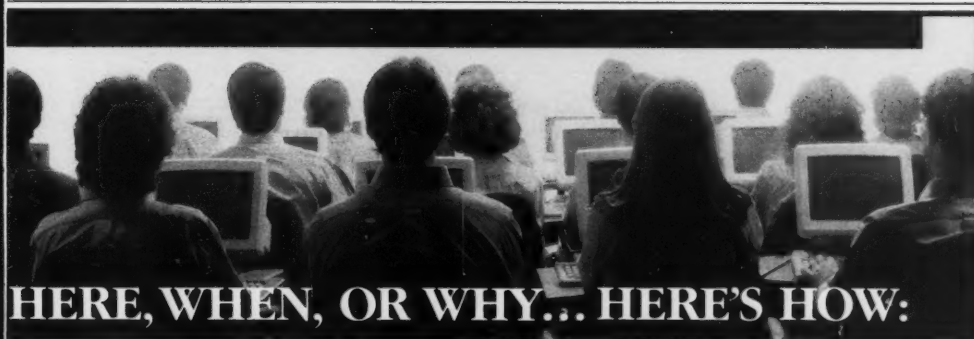
As fair, rational and equitable as chargeback may be if it is done correctly, line managers often have trouble understanding why they are charged what they see as exorbitant rates for service.

Chargeback is a frequently misapplied and artificial process that does not promote the intelligent, cost-effective use of computing. Rather, it serves as a disincentive that precipitates renegade computing through clandestine personal computers, minicomputers or expensive time-sharing services.

#### Mainframe alternatives

If, beset with the preceding problems, the mainframe is dying, what keeps it alive, and what impedes the acceptance of plausible alternatives?

Why hasn't the onslaught of critical literature issued in the last decade dislodged



HERE, WHEN, OR WHY... HERE'S HOW:

**BASIS systems are easily implemented, becoming quickly productive. And, that makes sense.**

One of the best benefits of selecting BASIS for your TIMS is the ease with which BASIS can be implemented and tailored to your existing applications environment. And, as many MIS/DP managers have discovered, BASIS even provides applications opportunities for end users, thanks to BASIS' fully integrated applications development facilities. Once implemented, BASIS databases are easily modified without disrupting systems operations. New files and record fields may be added or changed without reloading data.

**BASIS is accurate, efficient, and secure.**

Password protection and privilege code access secure BASIS installations at the database, index, record and field levels, to satisfy the most particular confidentiality requirements of your databases.

**If you like what BASIS can do for TIMS, then you'll love what DM® can do for DBMS.**



**BASIS TEXT INFORMATION MANAGEMENT SYSTEM. HIGH TECH. IN TOUCH. VERY USER-FRIENDLY.**

DM is the first relational DBMS with full-text handling capabilities integrated with complete database management facilities. DM provides superior integrity constraints, security features and maximum data independence for program-independent independence in DBMS applications.

**BASIS and DM are both products from the minds of Information Dimensions, Inc., a subsidiary of Battelle—since 1929, the preeminent independent research facility in the world.**

This proud heritage is your assurance the BASIS and DM systems are truly representative of the most innovative development in software technologies available for TIMS and DBMS applications. And, Information Dimensions provides a network of marketing, technical services and systems support, with offices and personnel worldwide.

**If you need to know who, what, where, when, or why... then call Information Dimensions, NOW.**

**CALL TOLL-FREE 1-800-DATA MGT**

*In Ohio, call collect (614) 761-7300*

**Information Dimensions, Inc.**

a BATTELLE Subsidiary  
655 Metro Place South  
Dublin, Ohio 43017-1396

BASIS and DM are registered trademarks of Information Dimensions, Inc.



# For years we've been network management products... a revolutionary network

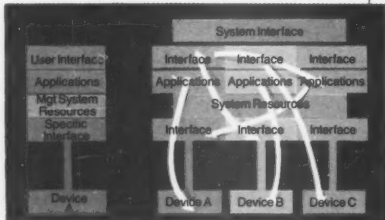
Back in 1978, Codex introduced the first independent network control system. And since then we've been busy introducing one network management innovation after another.

Now it's time for another revolutionary innovation. But this time, it's not simply a new network management product we're developing. It's an entirely new network management concept.

A concept unlike anything you've ever seen before. And a concept you've needed for quite some time.

## Why a New Concept?

In today's multi-technology environments, even the best of today's traditional schemes can't keep pace with user demands for comprehensive network reliability, serviceability, and growth. That's because no single system has ever been able to address universal network management requirements.



When your network is simple, so is managing it. But when it grows with multiple technologies, most network management systems simply run out of steam.

To get maximum network performance in these complex environments, a new level of integration is required. Which requires a new concept. One that allows you to address current network management needs, yet ensures you of optimum control over your network, no matter how complex it may be, or may become in the future.

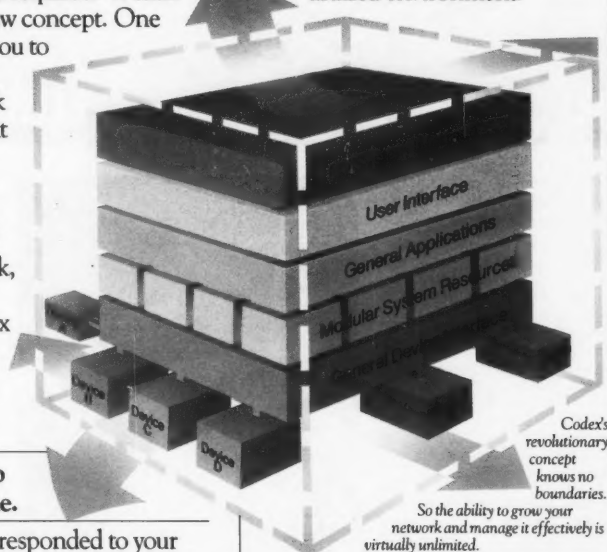
## Codex to the Rescue.

We've responded to your needs by employing a new concept to optimize your overall network's performance.

The result is a revolutionary system that's modular, incredibly easy to use, and offers an extraordinary user interface that provides an integrated systems view of your entire network.

To accomplish this, we've moved from today's proprietary era to our new direction for the entire network manage-

ment industry. By creating a system based on user demands for open architecture in a standardized environment.



Codex's revolutionary concept knows no boundaries.

So the ability to grow your network and manage it effectively is virtually unlimited.

## A System Architected for Growth.

Our new system is designed to incorporate the future, accommodating new networking applications as they are developed. That's because it's based on open architecture technology, consistent with emerging OSI standards. Which provides unmatched user flexibility, and unmatched potential for growth.

Within our new network



# introducing innovative products. Now it's time for network management concept.

management concept, all network devices are treated consistently. In fact, it defines a relationship between all network devices and the management system – a relationship never before established. So one system will handle all architected devices, as well as give you the structure to manage unarchitected devices.

## Standards Are the Roadmap.

As protocols and applications proliferate, the demand for standardization is greater than ever before. Everyone is talking about standards – they're critical to the future because they facilitate integration, choice and flexibility.

As the leading proponent of vendor-independent networking, Codex has always been an active

Complete range of network management and control systems
Extensive line of modems (up to 19,200 bps)
Complete selection of multiplexers, switches, and digital transmission devices
X.25 products, SNA gateways, experimental ISDN gateway
Network design and applications engineering support
National and multinational account management
Field service and customer education/training
License arrangements

No matter what your networking needs, Codex has the solutions.

contributor to the evolution of network management standards. So naturally, we designed our integrated network management system to be fully consistent with emerging OSI standards.

## True Integration Is Here.

With our new concept, you'll be able to get one consistent view of the entire network topology.

With a single management system you'll have the potential to manage and control your entire network – statistical and time division multiplexers, T1 muxes, modems, X.25 concentrators – and other network devices. And that includes access to your computing equipment.

And we've engineered a non-

proprietary technology that can work with other systems – in conjunction with IBM's NetView, for example – to give users truly integrated control of their network.

This level of control allows you to *take decisive corrective action* to optimize network performance. Because the information and the management commands for your entire network are integrated and provide a unified database, one system provides full problem, fault, event and performance management – with extensive diagnostic, restoral, reconfiguration and reporting capabilities to maximize overall network availability.

## Call For More Information.

Obviously, there's lots more to tell than this space allows. To obtain a free brochure outlining our revolutionary approach to network management, call 1-800-426-1212, Ext. 246. In Europe, call 32-2-6608980. Or write to Codex Corporation Dept. 707-46, Maresfield Farm, 7 Blue Hill River Road, Canton, MA 02021-1097. We promise it will change the way you look at network management forever.

**codex**  
MOTOROLA

The Networking Experts

Visit Codex at COMDEX/Fall, November 2-6, booth #1890



Our new network management concept allows you to control your network no matter how far it reaches.

the MIS community from the mainframe computing paradigm?

No one seriously debates the evidence of crisis. In fact, if anything, exaggerations and specious notions like the "hidden" applications backlog abound and are given great credence. Why does mainframe computing, despite severe assault, hang on and dominate the thinking of MIS professionals?

One answer lies in the observations I made earlier. The mainframe is not just an object of technology. It is a corporate information processing paradigm. It is the presumed medium for expressing serious commercial computing solutions.

The mainframe is a part of corporate culture. A change in culture is much more difficult to effect than a change in technol-

ogy. Thus, the frustrated carpenter blames his tools, not his craft. The current fourth-generation language obsession is an attempt to get rid of guilty tools, not wood.

A change in culture necessitates a transformation of world view. The mainframe crisis has been going on since the late 1970s, yet no one has ever reached the conclusion that the very nature of the mainframe and mainframe computing is the cause of the problem.

The situation is analogous to a paradigm shift in the scientific world. Quoting again from Kuhn, "The act of judgment that leads scientists to reject a previously accepted theory is always based upon more than a comparison of that theory with the world. The decision to reject one

paradigm is always simultaneously the decision to accept another, and the judgment leading to that decision involves the comparison of both paradigms with nature and with each other."

#### Mainframe defense

The corporate mainframe establishment, from chief information officer to data entry clerk, does not reject the mainframe paradigm because of indications the paradigm is in crisis. Confronted with crisis, mainframe users rally to the mainframe's support. They first modify it, then extend it, virtualize it or otherwise patch or fix it. The ardent mainframe advocate retrenches with each mainframe upgrade announcement and sandbags anew with more MIPS, more coupled processor ar-

chitectures and more operating system releases.

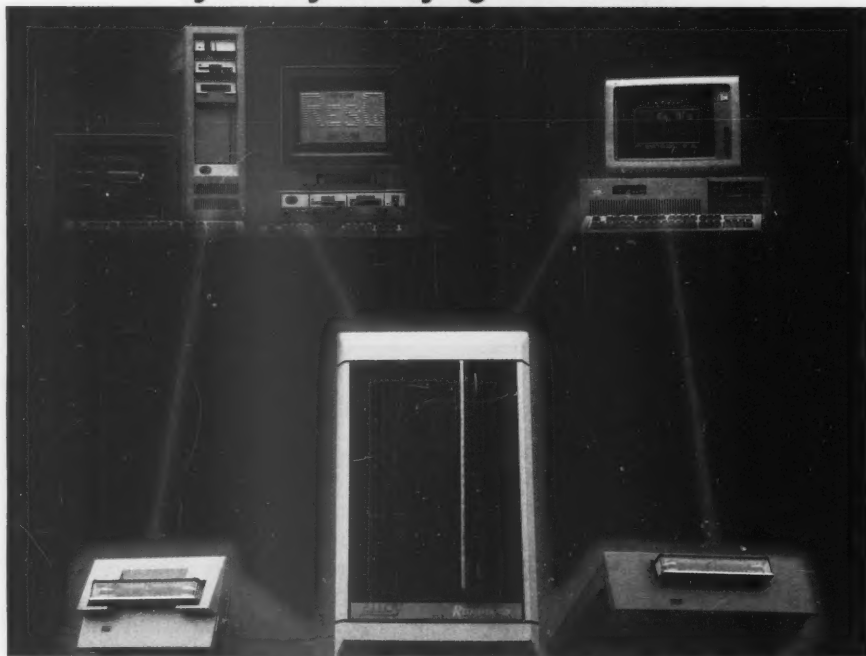
The corporate computing culture and the natural conservatism of the command and control apparatus predisposes MIS to avoid serious consideration of other solutions, preferring to simply dismiss non-mainframe alternatives as inappropriate. Consequently, mainframe adherents deny the feasibility of nonmainframe paradigms by defending the mainframe on the "objective" grounds that it is a superior problem-solving machine.

One way or another, the mainframe is defended. The defense is twofold. Mainframes are needed for power, and they are needed for control. Mainframe power and control are correlatively listed as a requirement for serious mainframe applications — as opposed to other kinds of non-mainframe and, presumably, nonserious applications.

But while the equivalent of mainframe power may be needed by banking applica-

## WARNING:

If you don't buy an ALLOY error-correcting tape drive, you may be buying into trouble.



ALLOY's error-correcting Retriever™ tape drives work with IBM standards — old and new.

#### The Torture Test

Before a tape drive becomes a Retriever, it's got to read tape — dirty tape, old tape, scratched tape, worn tape — and get the data back whole. Data that only ECC-encoding and error correcting tape drives can bring back. Retriever tape drives pass this test to help make sure that your data is readable — time after

time, years from now — when you need it. And that, after all, is the reason you backup your data. Don't settle for less.

#### Choose the Right Retriever for You

**Retriever/40** packs 40 MBytes of data onto a compact DC-2000 type mini-cartridge. Designed to fit into your AT or compatible, or Compaq 386™ Interchanges data with the Tape System/2.

**Tape System/2™** is the 40 MByte Retriever expressly designed to fit into your IBM Personal System/2™ Model 50, 60 or 80. No controller card required. Exchanges data with the Retriever/40.

**Retriever/120** gives you 120 MBytes of error correcting data

storage. Works with ATs and compatibles, Compaq 386 and all models of the Personal System/2. Ideal for network backup. Attach up to 4 Retriever/120's for automatic backup or restore of up to 480 MBytes of data — unattended.

To get your own Retriever — or to get more information — see your dealer; or call ALLOY today at (617) 875-6100.

**ALLOY**  
COMPUTER PRODUCTS

Alloy Computer Products, Inc., 100 Pennsylvania Avenue, Framingham, Massachusetts 01701. (617) 875-6100. TWX: 710-346-0394  
Alloy Computer Products, Inc., 9 Executive Circle, Suite 240, Irvine, California 92714. (714) 261-7061  
In Europe: Alloy Computer Products (Europe) Ltd., Tel. 0285-68671, Tlx: 43340 In Australia: Alloy Australia Pty. Ltd., Tel. 011-613-561-4968

**T**HE MAINFRAME crisis has been going on since the late 1970s, yet no one has reached the conclusion that the very nature of the mainframe and mainframe computing is the cause of the problem.

tions, utility industry applications or generic financial management applications, it cannot be technically demonstrated that there is such a thing as a "mainframe application."

Mainframes are not the only computers or the only processor topology that can deliver the computing power, throughput and control necessary to implement serious, enterprisewide, bet-the-business production applications and strategic information systems. It cannot be shown that IBM's mainframe 370 architecture, as opposed to some other, is uniquely designed to support these applications.

#### Application-neutral

To begin with, the machine language of the general-purpose IBM 370 commercial mainframe family is application-neutral — there are no instructions at a high enough language level to clearly support a recognizable business function.

There are no instructions such as "OPACCT" — open demand deposit account — or "POSTPUB" — post the paid utility bill — or "DOBLSHT" — do the balance sheet.

The machine languages of the IBM 3090 mainframe and the IBM Personal System/2 Model 80 perform the same primitive functions of logically or arithmetically adding and subtracting, testing for conditions and interrupting execution to go somewhere else to do something else.

Secondly, there are no machine instructions that perform these primitive functions any better materially in the one processor than the other. Mainframes offer direct support of data types such as packed, binary-coded decimal, numeric data and instructions to move large pieces of data elegantly from one memory to another. This advantage is largely nullified, however, by the fact that even software

# The Modem Industry Standard That's Actually High Performance.

In a world of substandard standards, it's rare to find a standard that's also the criterion for high performance. But, Microcom Networking Protocol (MNP)<sup>™</sup> is the industry standard for high speed, error-free data communications: A Microcom Protocol Modem<sup>™</sup> uses MNP to virtually double the effective throughput of its rated speed. So our 1200 bps modem flies at up to 2400 bps. And our 9600 bps modem is lightning fast at up to 19,200 bps. And since the world is characterized by imperfect phone lines, MNP ensures completely error-free communications . . . even on standard dial-up lines.

## What is a Protocol Modem<sup>™</sup>?

Microcom puts MNP error-checking, protocol intelligence and other features in the modem . . . not burdening your computer. Microcom modems support common standards, including Bell 103, 212A, CCITT V.22, V.22 bis and V.29FT. The Microcom SX command set and Hayes AT<sup>®</sup> command set are both supported. And the highest mutually-supported speed is automatically negotiated with other modems.

## Microcom Networking Protocol<sup>™</sup>: Why it Became the Standard

MNP offers unparalleled performance. Its data compression and error-correction have made it the protocol of

### Microcom and the Others . . . The Difference is Day and Night

Product Feature	Microcom AX/9624 <sup>+</sup>	Another Major Vendor
Initial Fall-Back Speed	7200	4800
Installed base	>150,000	<1,000
Number of stored phone numbers	9	4
Employs industry standard MNP	yes	no
# of compatible MNP modem vendors	40+	0
Supports CCITT V.29 FT modulation	yes	no
Password Security Option	yes	no
Upgradeable product line	yes	no
Voice/Data Switch	yes	no
Hardware Settable Serial Port Speed	yes	no

choice for fast, reliable data transfer. But, a standard must be used by others to really be a standard: MNP is supported by scores of other modem manufacturers and value-added networks, including GTE<sup>®</sup> Telenet/UNINET<sup>®</sup> (now U.S. Sprint), GEISCO<sup>®</sup>, CSC INFONET<sup>®</sup> and the IBM<sup>®</sup> Information Network. In fact, classes 1 through 4 are in the public domain.

MNP Class 6 offers the highest performance: Universal Link Negotiation starts at a common lower speed, and negotiates up to the highest, mutually supported speed and class. A Statistical Duplexing algorithm dynamically emulates full-duplex service. Data

compression further improves effective throughput to as high as 19,200 bps.

MNP Class 5 also uses data compression to analyze user data and adjust compression parameters. An overall compression factor of 1.6/1 or 63% is achieved. Maximum protocol efficiency is 200% of rated modem speed when combined with other MNP features.

MNP Class 4's Adaptive Packet Assembly generates larger packets over clean lines, for increased throughput and reduced protocol overhead. When increased error rates are detected, smaller and smaller data packets are created to increase transmission efficiency. Class four produces up to 122% of rated modem speed.

## Set Your Standards High with Microcom Protocol Modems<sup>™</sup>

Don't accept closed protocols or inferior performance. Standardize on the high performance of Microcom. Ask for your full-color brochure on the complete line of Microcom modems and network products.

**800/822-8224**

**MICROCOM<sup>™</sup>**

1400 Providence Highway  
Norwood, MA 02062  
617-762-9310 Telex 710-336-7802

**Set Your Standards High.**



internals programming is turning toward higher level, third-generation, compiler-based languages like C.

Nevertheless, assembly language coding for the Intel Corp. 80286 and 80386 processors is actually more powerful and more consistent with structured programming constructs than the 370's assembly language.

In short, the machine languages of mainframes and microprocessors are equally applicable

**Throughput.** Some mainframe defenders will acknowledge the processing speed and memory of microprocessors such as the 80386. What they counter with is that mainframes boast throughput while minis and PCs do not.

"Throughput" describes a real-world, wall-clock time view of computer work. In the IBM Data Processing Glossary, it is

"a measure of the amount of work performed by a computer system over a given period of time, e.g., jobs per day."

Computers perform work by executing primitive instructions on data that is resident in internal storage areas or in memory. If mainframes offer no special advantage in the execution of instructions or the ability to store data in memory, then where

does the special mainframe throughput come from?

Disciples point to the channel capability of mainframes. Channels truck data from storage devices to memory. The mainframe does not do I/O per se, nor does it physically contain all of the mainframe data. Instead, data is physically distributed on storage devices that must communicate with the mainframe

through channel intercession. The channel communicates independently with controllers that communicate with the actual devices that finally do the I/O. The channel then streams data into mainframe memory, interrupting mainframe operation to communicate that the requested I/O operation was completed.

Compare a mainframe fueled by obedient robot-like channels

**C**URRENT PS/2 products rival existing mainframes and equal or dwarf the mainframes of about eight years ago.

for serious applications. Other areas to examine include processor speed, memory, throughput and control.

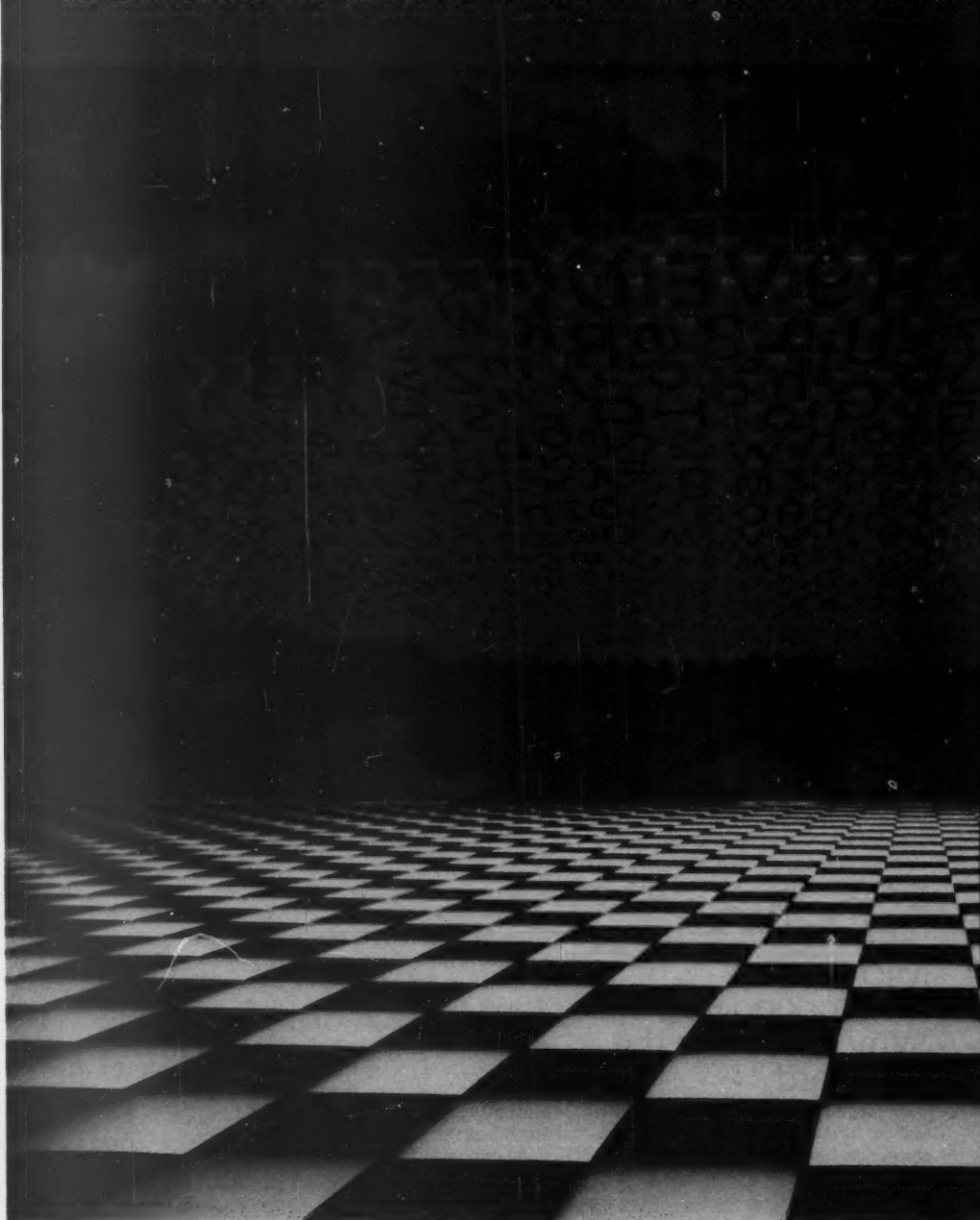
**Processor speed.** The processing rate of the PS/2 Model 80 has been quoted at 2.88 MIPS. The current IBM 4381 Model 22 is quoted at 3 MIPS. Yesterday's 370/168 Model 3 — really big iron, circa 1976 — was about 2.5 MIPS. Today's big iron, an IBM 3090 Model 600E, weighs in at 76 MIPS. Thus, current PS/2 products rival existing mainframes and equal or dwarf the mainframes of about ten years ago.

The typical retort to these observations is that microcomputer MIPS are not the same as mainframe computer MIPS. The myth is that microcomputer MIPS are inferior and lower grade. However, there is nothing to support this retort. As stated above, there is no substantial, quantifiable difference between 80386 machine instructions and 370 machine instructions. An analysis yields only that MIPS measurements, which are admittedly imperfect, are still quite comparable and that mainframes are not the only source of MIPS power.

**Memory.** The other key indicator of a computer's power is memory. A computer must have data in memory before it can process it with the primitive machine instructions described above. The more memory it has, the less time has to be spent shuffling data back and forth to much slower secondary-storage devices such as disks.

The IBM mainframe architecture allows for the direct addressing of 2G bytes of memory. The 80386 microprocessor architecture allows for the direct addressing of 4G bytes of memory. In uncluttered terms, with no reference to virtual or expanded memories, an 80386 chip in long linear-address mode supports twice as much directly addressable memory as an IBM 3090.

WE BELIEVE THAT THE GENIUS OF THE FUTURE LIES NOT IN TECHNOLOGY





with a network of cooperative intelligent workstations. PS/2 devices can be linked through Micro Channel facilities and local-area network (LAN) products that run from 4M bit/sec. IBM Token-Ring networks to 10M bit/sec. Ethernet networks. Other LANs of 80M bit/sec. are on the market.

Furthermore, devices are now available that permit opera-

tion across telephone companies' T3 circuits at channel speed. Ford Motor Co. is using this capability to link mainframes to peripherals six miles away.

Throughput, the darling of mainframe defenders, is largely a function of the transfer rate existing between the requesting data processor and the releasing data manager. The extent to which nonmainframe networks

approach an overall data transfer rate of mainframe channel speed is, to a large degree, the extent to which they possess mainframe throughput.

Finally, the throughput issue is contingent on the premise that during a transaction session, computers constantly write and rewrite data to their final nonvolatile data storage resting place. When mainframes had 64K

bytes of storage, this premise held true. But when large working sets of data are brought into the memory all at once for processing, the impact of the I/O data transfer rate on overall throughput is greatly reduced.

**Control.** The mainframe cannot be defended on the grounds that it has a unique kind of superior, technical problem-solving power. But does it offer

superior control characteristics? Even if networks of high-performance PCs can rival mainframe system throughput and economics, data is scattered all over the network at each file server or, worse still, at each workstation.

With the mainframe, we know where the data is. It is in the computer room, and we can assume it is the most current enterprise-wide version — the real version. We can have multiple users updating this single master

ALONE, BUT IN THE ABILITY TO MANAGE IT.

#### Information. Overpowering Force? Or Powerful Resource?

In today's fast-paced, high-tech business world information comes with no guarantees. It's either use it, or lose it. So how well you manage information can very well be the difference between business as usual and unusually good business. And that's where we come in. With the kind of end-to-end expertise most companies can't offer.

At Bell Atlantic, we can show you how to put information to work. How to gather it. Sort it. Organize it. How to get it to the right people. Apply it to the tough problems. And use it to gain the edge. With everything from local telephone to mobile communications, voice/data networks to software and computer maintenance, information systems to equipment leasing and financing, we can put it all together.

We're an integrated family of companies offering a broad range of solutions to your information and communications needs. And with our unmatched record of innovation, reliability and experience in moving information, we can put the full power of information within your grasp.

For more information about the Bell Atlantic companies, call toll-free 1-800-621-9900.



**Bell Atlantic**

WE MAKE TECHNOLOGY WORK FOR YOU.

**LOCAL TELEPHONE AND MOBILE COMMUNICATIONS**  
Bell of Pennsylvania • C&P Telephone •  
Diamond State Telephone • New Jersey Bell •  
Bell Atlantic Mobile Systems

**INFORMATION AND COMMUNICATIONS SYSTEMS**  
Bell Atlanticcom • Bell Atlantic Business •  
Supplies • A Beeper Company • CompusShop •  
Bell Atlantic Business Center • MAI Canada •  
Telecommunications Specialists, Inc.

**COMPUTER MAINTENANCE AND SOFTWARE**  
Sorbus • Technology Concepts, Inc. •  
Electronic Service Specialists, Ltd.

**DIVERSIFIED FINANCIAL SERVICES**  
Bell Atlantic TriCon Leasing • Bell Atlantic  
Systems Leasing • Bell Atlantic Properties

**M**AINFRAME computing is a cultural pillar sunk deep into 30-year-old data processing bedrock.

version and making consistent reference to it.

Control is imposed through the natural bottleneck that a single mainframe computer causes. However, control is a logical idea, not a physical one. The goal is to have a seamless single image of the information resource, managed as a corporate asset, but not necessarily deserving of one repository any more than a corporation needs to have all of its cash in one bank.

There should be one exacting reference to information states, but this need not, and really should not, be implemented with one physical component. Besides the inevitable performance penalty, doing so is akin to putting all of one's eggs in one basket.

The intelligent distribution of information — and information about the information — through a network actually improves both control and performance. The technology is available to provide a distributed dictionary that will seek out and find where information is stored across a network and transparently present it to the business application system.

#### New paradigm

Despite the preceding observations, which call into question the primacy of mainframe power and control, the mainframe paradigm of computing will not die tomorrow.

As stated, the mainframe does not survive primarily because of arguments that demonstrate superior problem-solving ability vis-a-vis the newfangled, "anemic" corporate personal workstation technology of PS/2 products. Mainframe computing is a cultural pillar sunk deep into 30-year-old data processing bedrock.

The following, again from Kuhn, should illuminate our near-term assessment of the co-gency of direct arguments on behalf of nonmainframe computer alternatives.

"Paradigm debates are not

really about relative problem-solving ability, though for good reasons they are usually couched in those terms. Instead, the issue is which paradigm should, in the future, guide research on problems, many of which neither competitor can yet claim to resolve completely.

"A decision between alternate ways of practicing science is called for, and in the circum-

stances, that decision must be based less on past achievement than on future promise. . . . A decision of that kind can only be made on faith."

Faith is a tough sell in a competitive world. An unbiased assessment of nonmainframe technology paradigms in the context of carefully executed systems planning is somewhat easier.

But what is the new nonmain-

frame paradigm? At least in part, it is the PS/2 line of personal computers.

#### Building a base

These machines and their successors will constitute the basis for high-performance, personal workstation networks in corporations. These networks, based on peer-to-peer distributed relational data base technologies,

will support serious office information systems that will replace business applications based in mainframe computer rooms.

It is important to understand the true capabilities of corporate-use personal workstation devices. Progress in understanding and implementing this new paradigm is constantly thwarted by myths that distort the extent to which mainframes offer pow-

er and control advantages over nonmainframes. Progress is also plagued by revisionist theories of mainframe connectivity. Mainframe connectivity offers nothing more than a turbo-charged version of dumb terminal dependency, not a viable plan for eliminating mainframe pathologies such as applications backlogs.

However, a strategic assessment of nonmainframe capabilities cannot be successfully conducted on the basis of simply comparing existing products. Sound strategic technology commitments can only be reached through structured systems planning.

Such planning should produce a technology architecture; that is, a model of the future information processing hardware, software and data communications infrastructure.

#### Technology with vision

It is absolutely critical that the technology architecture phase of systems planning is not unreasonably constrained by constant reference to what currently exists in the data processing marketplace. Because it is a model, it does not presume that all of the pieces are immediately available. And it does not answer all of the questions regarding how the pieces will fit together.

The planning process should come up with a future, end-state technology architecture that rationally looks beyond the product offerings of the day and determines a prospectus of future strategic technology directions. In that way, technology can be acquired when it truly is a competitive weapon, with eyes open to the attendant risks of being an innovator.

Finally, systems planning is essential because the timing of the transition to the nonmainframe paradigm will in many cases be conducted on a project-by-project basis. Each project can be conducted and each application built with the best technology available, with an eye toward near-term improvements. Gradually, with each project success, organizations will embrace the new paradigm more regularly and naturally.

In summary, there are no "mainframe applications." Although the assimilation of this fact into the collective consciousness of information processing will proceed at a glacial pace, it will ineluctably occur. It is not unlike paradigm shift in science.

The way to move forward in a prepared and productive way is to preface individual paradigm shifts within the enterprise with a thoroughgoing systems planning exercise that stresses the creation of an end-state technology architecture using modeling techniques.

The best time to do this is now — while the mainframe is still alive. •

## A C C E S S

### MCI'S COMM Desk.™ Innovative software that lets your PC speak with the world.

MCI's COMM Desk software can put you in touch with the world. Just insert COMM Desk into any IBM PC or compatible and you have reliable, cost-efficient access to MCI's international messaging and telex services.

Like MCI's SAFE\*, the world's most advanced, feature-rich, controlled telex system. You electronically forward your messages to MCI, and we dispatch them to more than 200 countries worldwide—24 hours a day! MCI's IN-SAFE\* that efficiently manages the flow of all incoming messages to virtually eliminate busy signals. Or MCI MAIL\* that can give your firm the option of electronic or hard-copy messaging to practically anywhere in the world.

With MCI's COMM Desk, you can automatically send and receive messages at your PC while you work on other PC applications. You can set up archiving and message journals for effective traffic management. And you've always got help—with easy-to-read help screens and our toll-free "hotline" support center.

Let your PC speak with the world.  
See the details below on how to  
receive your COMM Desk  
demo disk.

#### COMMUNICATIONS FOR THE NEXT 100 YEARS.™

Send \$5.00 for your COMM Desk Demo Disk  
to: MCI International Marketing Department,  
2 International Drive, Rye Brook, New York 10573.

Name \_\_\_\_\_  
Title \_\_\_\_\_  
Company \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_  
Telephone Number \_\_\_\_\_

\*MCI, the MCI logo, SAFE, IN-SAFE and MCI Mail are registered service marks of MCI Communications Corporation (MCI). COMMUNICATIONS FOR THE NEXT 100 YEARS is a service mark of MCI. COMM Desk is a trademark of MCI. © MCI, June 1987. IBM is a registered trademark of the International Business Machines Corporation.



## When was the last time you had this kind of passion for programming?

If you can't remember, it may be time to ask yourself why.

When you started your career as a computer specialist, you probably didn't envision yourself as a detail checker. But since applications require extensive coding, debugging, and documenting, your job became that of a proofreader—albeit a highly paid one.

Now you can break free from much of the tedium, and find the passion in your job again.

### **Introducing IntelGen: The Programmer's Source-code Generator.**

IntelGen automatically generates all the COBOL or PL/I code for applications in both on-line and batch environments—including BMS maps (for CICS) and MFS formats (for IMS/DC).

What's more, applications developed with IntelGen are 100% stand-alone. You run them totally independent of IntelGen or any other software product.

IntelGen also takes care of other routine work, such as verifying your screen input fields. And when you're finished developing your application, you can relax—because IntelGen automatically generates the program documentation for you.

### **No Retraining Necessary.**

You'll start reaping the benefits of IntelGen right after you install it. Not months later. Because IntelGen allows you to intermix COBOL or PL/I with its own simple—yet powerful—4GL command language. So you can continue working with the languages you're accustomed to—and incorporate IntelGen's full capabilities as you become familiar with them.

### **Easy To Use.**

With IntelGen, you'll work with one set of simple, English-like commands. For more commonly used commands, your work is made even easier with fill-in-the-blank screens. What's more, an on-line syntax editor catches errors as they are entered—so you don't have to wait for a compiled listing to correct bugs. And if you ever lose your way using IntelGen, a complete on-line help facility is just a function key away.

### **Use Your Existing Data Dictionary.**

While most source-code generators won't let you use your existing data dictionary or library management system, IntelGen will. So you won't have to waste time and money revamping your systems before you enjoy the benefits of IntelGen.

### **Free 30-day Trial.**

For a free, 30-day trial of this remarkable program, please fill out the attached reply card. Or, call us toll-free for fastest response. OEM, VAR and Service Bureau programs are also available. Look for IntelGen product seminars offered in your area—call for dates and locations.

With IntelGen doing much of the routine work of applications development, you'll find the passion in your job again.

**800-642-0177**

In Canada: 416-671-2272/In Europe: 44-1-631-3696



**On-Line  
Software  
International  
Authorities  
in IBM  
Software**

## **IntelGen. *The Programmer's Source-code Generator.***

IBM is a registered trademark of International Business Machines Corporation.



# Service Power<sup>2</sup>.

When it comes to keeping your IBM® and DEC® systems up and running, you need a partner you can rely on to deliver responsive, dependable service that's truly second to none.

A partner who knows your DEC VAX®, PDP®-11, and IBM®/3X systems and peripherals. And who will work with you to meet your needs and your budget.

You can put that kind of power at your disposal with CUSTOMCARE® Service from Unisys. For starters, we offer some of the most dedicated, experienced professionals in the service industry.

And we get that expertise to your site with one of the best response times in the business.

Now add in support from a seasoned management team, effective diagnostic tools, the technical expertise of our Customer Support Center—plus the commitment of a



\$9 billion company serving 60,000 customers in over 100 countries.

When you also consider that we can do all this and possibly save you a lot of money, you'll want to give us a call before your current service contract comes due.

You may even qualify for Two FREE Months of CUSTOMCARE Service. Find out how when you send for your FREE CUSTOMCARE Information Kit today. Just mail the coupon below or call us toll-free at **1-800-547-8362, Ext. 03.**

**UNISYS**  
The power of <sup>2</sup>

## Special Offer: Two FREE Months of CUSTOMCARE Service for Qualified Systems Users.

Mail this form to: Unisys Corporation, CUSTOMCARE Service, P.O. Box 1804, West Chester, PA 19382 or call toll-free 1-800-547-8362, Ext. 03.

- ☐ YES, I want to find out how to qualify for your Special Limited Time Offer of Two FREE Months of CUSTOMCARE Service from Unisys on the systems I have indicated below. Please send me more details, including my FREE CUSTOMCARE Information Kit.

Host System/Equipment on Site:

- ☐ DEC PDP-11 Family, model # \_\_\_\_\_  
☐ DEC VAX-11/700 Series, model # \_\_\_\_\_  
☐ DEC MicroVAX®II  
☐ STC® Tape, Disk and Printer Subsystems  
☐ PC/Terminal Networks (50 units or more)  
☐ Other \_\_\_\_\_

Name \_\_\_\_\_

Title \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Telephone (\_\_\_\_\_) \_\_\_\_\_

Best Time to Call AM \_\_\_\_\_ PM \_\_\_\_\_

CUSTOMCARE is a service mark of Unisys Corporation.  
DEC, PDP, VAX and MicroVAX are trademarks of Digital Equipment Corporation.  
IBM is a trademark of International Business Machines Corporation.  
STC is a trademark of Storage Technology Corporation.  
© September 1987, Unisys Corporation

CCWJ19



# You are what you do

*As surely as television, the computer socializes people into patterns of interaction and behavior*

BY TIM LYNCH

**W**hat toll does the forever onward press toward automation exact on the human psyche? In our efforts to computerize society, the potentially harmful psychological costs to humans must be weighed against the benefits provided by using intelligent machines.

Enter a new area of psychology — robopsychology. Coined after Isaac Asimov's term in his book, *I, Robot*, robopsychology examines how people cope with computers on a psychological level.

Just as we should not automate without considering the financial impact on a business, we should not computerize without taking into account the impact of such automation on humans.

The computer, like all major technological innovations, has had a profound effect on society. As surely as television, the computer socializes; it teaches us patterns of interaction, behavior, social norms and thought processes.

To study the impact of computerization on society, I conducted a qualitative research study in which 60 Massachusetts-based Unix programmers were interviewed. The interviews were executed by "Sig-mund," an artificial intelligence program running on a Digital Equipment Corp. mainframe.

The study focused on three areas: the subject's relationship with the computer, the subject's interpersonal relations and how the subject perceives the com-

Lynch is president of New Wave Consultants in Quincy, Mass., and the first robopsychologist. He consults and researches in the psychology of human-to-computer interaction and its effects on the personality and interpersonal relations. He received his doctorate in humanistic psychology from Boston University.



WARREN GERERT

puter's impact on himself and others.

The study results show that the patterns of human interaction are changing in ways that directly relate to the way that we interact with computers. Our views of humans and our expectations of human interpersonal relationships are being altered by our use of the computer, as are our patterns of work and thought.

We are being shaped by the computer, and it is important to recognize these changes if we are to control them — to mitigate their ill effects and enhance the good ones.

## Interaction patterns

For example, every time we use a computer, it teaches us a pattern of interaction. We are forced to use the machine in a

very precise, emotionless manner, using specific words in a regimented, predetermined order. If we veer from the proper interaction style, we get an error message and must correct our failed interaction in order to accomplish our goals.

To use the computer effectively, therefore, we must accommodate ourselves to the world of the machine.

This is not true of any other tool in society. We do not think like a hammer in order to put a nail in the wall. To use a computer, though, we must adjust our thought patterns to that of the machine.

The only other activity we engage in that requires using similar adjustment skills is dealing with humans. We, like computers, have certain rules of communication that must be fol-

lowed if we are to accomplish our goals and reach an understanding with others.

## Learning by doing

Socialization — a basic principle of psychology — is the process by which we learn the rules of effective communication. Socialization forms a society's foundations, teaching people to accomplish goals in a socially acceptable manner.

The usual method of learning these norms and patterns is through interaction. We learn by doing. Through socialization, we learn to be human.

However, technology also socializes us, because people tend to generalize what they learn. That is, they apply previously learned patterns of interaction to a broad range of situations.

Furthermore, my research shows that the interaction patterns learned by using the computer can carry over to interpersonal interactions. To varying degrees, depending on usage and level of sophistication, many computer users communicate with and relate to people the same way they interact with their intelligent machines.

In other words, the more involved with the computer a user becomes, the more his behavior reflects that of the machine. The heavy user begins to crave logic and order in all things, especially human relations. He expects relationships to proceed directly from the initial meeting to a deep, interpersonal phase. For him, the ideal relationship consists of intense intellectual discussions but is devoid of emotional intensity, mirroring the interaction patterns he has with his computer.

## Programmers prey

Programmers, whose jobs are fraught with a high level of intensity and a regimented style of interaction, fall prey to the computer's adverse effects more

- Study shows users picking up PCs' habits
- Programmers affected most
- Little sleep, no food, great expertise



**How to install our office**

**How to expand our office**

The Hewlett-Packard StarLAN office networking system works along the same lines as your existing phone system.

So where the phones go, your PCs can go.

It's a system with built-in flexibility, because the twisted pair wiring you need

to plug into is often already in place.

So it's an altogether more accommodating and cheaper idea than coaxial PC networks, such as Thinwire Ethernet.

And, of course, HP StarLAN is based on the IEEE 802.3 industry standard.

we never  
stop  
asking

"What if..."



A black and white photograph of a hand holding a network cable connector. The hand is positioned in the upper left quadrant of the frame, with the thumb and index finger gripping the connector. The connector is a standard RJ45 Ethernet plug. The background is a plain, light color.

**networking system.**



A black and white photograph of a person wearing a white lab coat. The person is holding a network cable in their right hand. The cable is a standard Ethernet cable with a RJ45 connector. The person's face is not visible, and the focus is on the cable and the lab coat. The background is a plain, light color.

**networking system.**

As always, we asked a lot of "What if..." questions before we came up with HP StarLAN as part of Hewlett-Packard's total office systems solution.

To plug into our networking system, call 1 800 752-0900, Dept. 283B.



**HEWLETT  
PACKARD**

often than any other type of user.

The 60 programmers I interviewed have spent at least five hours every day for the past seven or eight years at their machines. But, more tellingly, when in the midst of a project, these programmers routinely spend intense sessions of two or three consecutive 12-hour days working at the computer.

As a result of being what I consider overly involved, they all exhibit certain characteristic patterns of behavior that mimic their interaction patterns with the computer.

For example, those who are extremely involved with the computer expect the pace of interpersonal relationships to be faster than is normally acceptable. Overly involved computer

users expect the speed with which a relationship develops to match the machine's pace: to be very fast — almost instantaneous — but also deep and intense.

#### Instant gratification

A case in point is the person who expects instant satisfaction for his problem. One programmer I interviewed told of going to his

sales department, walking directly into the manager's office and demanding that his friend, who owned a computer store, get copies of the new software he was developing before anyone else did. He just walked in without knocking and stated, "Send my software to Fred right away," and left.

Similarly, many fellow psychologists report that computer

professionals have gone to see them and demanded that their problems be resolved in a single one-hour session.

With the computer, a worker engages in immediate, intense interaction. This pattern too often carries over into the intense computer user's interpersonal life, causing him to bypass customary societal niceties and to plunge directly into rather forward behavior upon making a new acquaintance.

Such behavior can obviously cause problems for a company. Work is a social, as well as a pro-

**W**HILE a cool head is often needed in decision-making, intense computer users tend to rely solely on logic and disregard the equally important creative process.

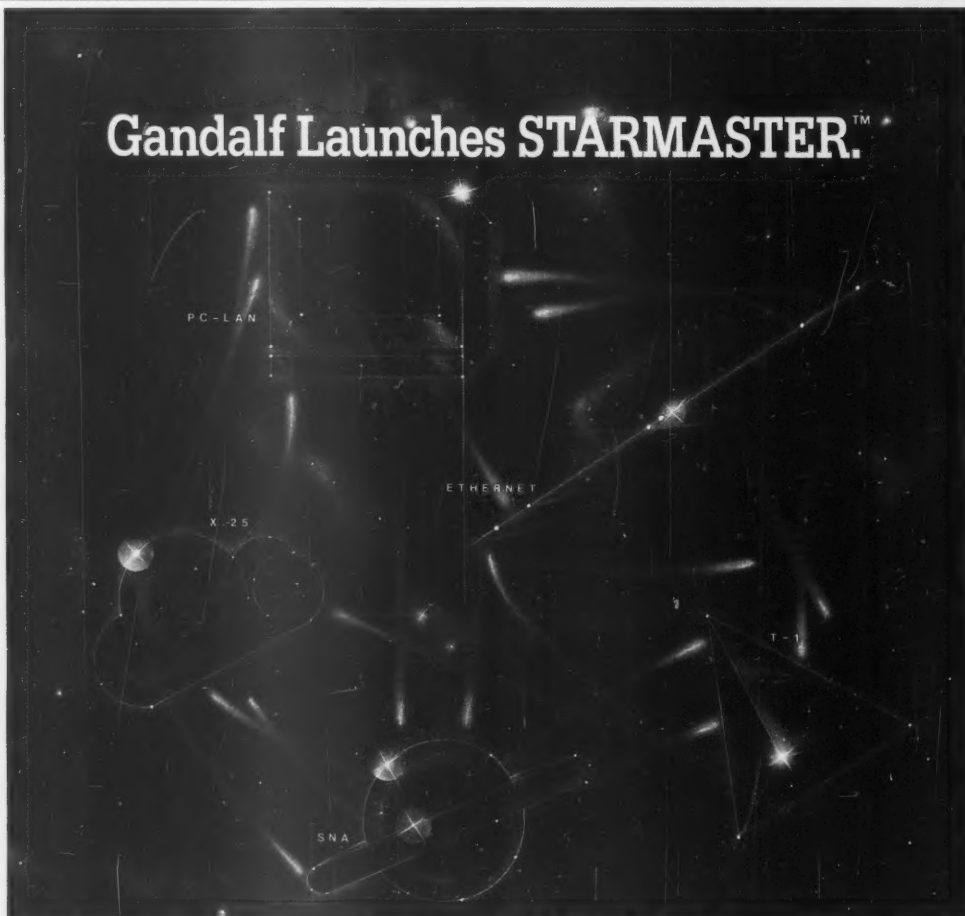
duction, process. If some employees expect interpersonal relations to proceed at warp speed, it will be upsetting to those accustomed to a much slower pace. Miscommunication can result, causing problems in the development of new products or in establishing the team spirit vital for a well-functioning company.

#### Staff conflicts

From my consulting experience, I have found the major area of conflicting styles in a company to be between product development and the marketing or sales staffs.

For example, a marketing team asked for information from a nontechnical end-user perspective concerning a certain function of a new software package. The end users received a 40-page report discussing the advantages of one source code over another. The report was factual, intellectual, delivered quickly — and totally useless. This occurred because two cultures collided, and neither fully understood the other's perspective.

My study also found that one result of increased computer use was an increase in use of a detached logic when dealing with other people. When asked about the changes they had undergone



## The new, hybrid virtual connectivity system that helps you make these connections...and more.

Welcome aboard STARMASTER. Destination: the future of network communications. Estimated time of arrival: today.

Gandalf proudly introduces STARMASTER...the advanced synchronous, modular network system that integrates the technologies, standards, applications and products of various vendors, independent of intervening protocols or transport facilities.

STARMASTER links users, terminals, personal computers,

workstations, peripherals and transport systems into one cohesive, applications transparent network.

It's ready to link async, sync, fax, voice and video users at a lower cost and higher throughput than alternative solutions. STARMASTER puts you in control of your entire network...giving your computing investment a strategic edge. And because it's a modular system, it can be individually customized to your specific needs and applications.

And it's all backed by Gandalf's full range of support services. The future. To get there, you've got to have connections.

1-800-PACXNET, EXT. 493  
In Illinois: 312-541-6060  
In Canada: 613-226-6500

Productivity  
Through Connectivity™

**gandalf**

### IBM MAINFRAME INTERFACES

- \* TO SIAC THRU DOT (P&S)
- \* TO DTC THRU LU6.2 (CAGE)
- \* TO SWIFT THRU AN ST200, etc.

### I & G SOFTWARE ASSOCIATES

1572 East 18th Street  
Brooklyn, N.Y. 11230



because of computer use, many subjects replied in a strikingly detached manner.

One respondent said, "It has tended to isolate me, but it has allowed me to work in a more logical way." Another stated, "I have developed a way of thinking that is precise and exact, very literal. I take everything literally."

While a cool head is often needed in decision-making situations, intense computer users tend to rely solely on logic and disregard or deny the equally important creative process. Studies such as the ones being done by Mary Henle at the New School For Social Research in New York and J. P. Guilford at the University of Southern California show that creativity — earmarked by intuition and emotion — is not usually a logical enterprise.

Thus, overly involved computer users often cannot make the leap from a set of data or experiences to a unique creative product. What flows from logic alone is merely a refinement of a previous product. The overuse of logic precludes risk taking, which is basic to creating radically new products.

So we come to a dilemma. As creative people spend more and more time working at computers, they become increasingly logical, losing the creative edge that made them valuable in the first place.

#### Isolation

A high achiever in his professional life, the intense computer user places unrealistic expectations on both himself and his partner in the pursuit of an ideal relationship. As with the machine, these people seek an intense personal relationship with little or no emotional content, pursuing deep human relations without the patience normally associated with social encounters.

This is often met with frustration and failure, since human relations take time and patience. Because of his lack of success, an intense user gradually narrows his social sphere to include only other computer users. He uses the computer as the basis of the relationship and as the primary topic of conversation.

As he meets with increased failure in the social sphere, the heavy computer user becomes increasingly isolated from other people, turning more and more to his machine for satisfaction and self-esteem.

"A friend of mine," one interviewee reports, "is practically a hermit. He has an obsession with this [computer] stuff and tends to act like a 4-year-old when it comes to people. He is socially insensitive." The interviewee also says that when this friend becomes angry, "he just completely crawls into a hole." He follows the same course if a woman breaks off a relationship with him. "It's sort of a revenge

cycle," he says.

Another respondent tells of an acquaintance who seemed to do nothing but hack on his computer all last year. "This guy did not know how to communicate with people. What was worse was that he had no idea what he was missing."

Yet another respondent states, "I know people here who seem to think that the computer

is their friend — and maybe their only friend." He describes these people as having difficulty relating to people. "They find it easier to talk to a machine."

#### Mind-altering effects

Computers are changing our society functionally and psychologically. We must address the dangerous side effects that come part and parcel with the comput-

er age: the insidious altering of our psyches and our ways of dealing with other people.

Those who use computers must make a concerted effort to maintain social contacts, not only within but also outside of the computer field, in order to strike a balance in their lives.

As one computer professional put it, "If you're in a position where you're spending a good

amount of an eight-hour day at a terminal, then you're withdrawn. You are not interacting with people, and I think that's dangerous."

If we ignore the dangers of computers and make no effort to mitigate them, we relegate the human to the level of the machine and, in the process, lose that which makes us uniquely human. ■

# XEROX

## Hello 4060 Computer Printing System. Good-bye Preprinted Forms.

When you install the Xerox 4060 Computer Printing System, you'll create and store forms electronically, unlike line printers that require preprinted forms. You can also store logos, signatures and a wide range of fonts for use on all your reports and printed documents. So, not only will you improve your bottom line, but the quality and readability of your data center documents.

In less time than it takes for line printers to turn out a job, the 4060 completes a finished report, ready for distribution, on convenient, business-size paper. Every page is a high-quality original. No more messy carbons. No time-consuming decollating and bursting.

What's more, while you save time, you also save money. The 4060 is competitively priced with line printers, but the total operating costs can be much less. And although the 4060 is extremely reliable, there's the added bonus of responsive service and support from Team Xerox.

For a limited time, the 4060 Computer Printing System comes with special price incentives. To find how the 4060 can work best for you, call or clip the coupon below.

#### Team Xerox. We document the world.

I'm interested in learning more about the Xerox 4060 Computer Printing System.

☐ Please send more information.

☐ Please have a sales representative contact me.

Send this coupon to: Xerox Corporation, P.O. Box 24, Rochester, NY 14692.

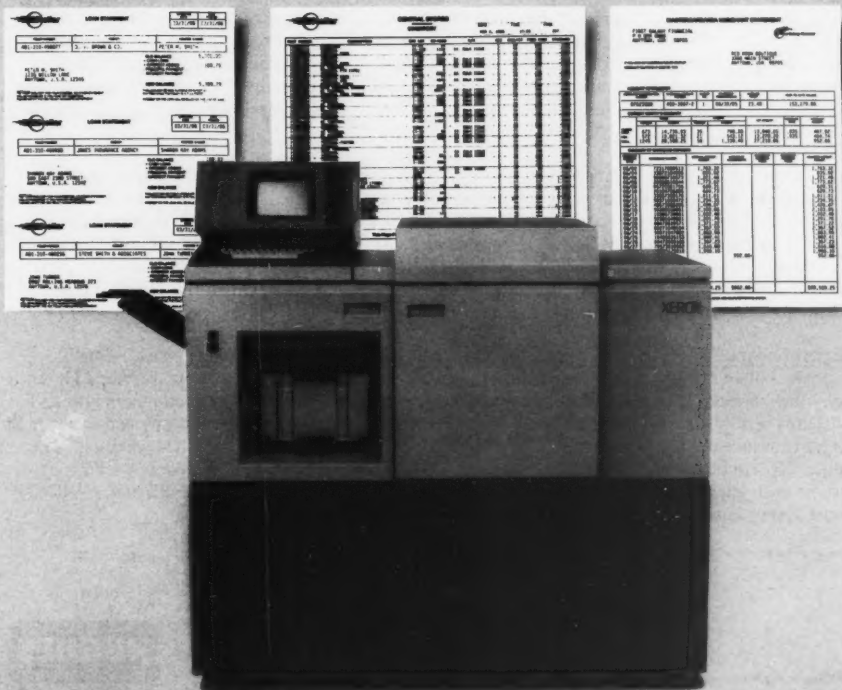
NAME \_\_\_\_\_  
COMPANY \_\_\_\_\_ TITLE \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
CITY \_\_\_\_\_ STATE \_\_\_\_\_  
ZIP \_\_\_\_\_ PHONE \_\_\_\_\_

Or if you can't wait, call:

**1-800-TEAM-XRX, ext. 201A**

013-10/19-87

XEROX® and 4060 are trademarks of XEROX CORPORATION.



# 'The passing of remoteness'

BY PHILIP BOSSERT

I remember poem about a man sitting on a hill overlooking his hometown on a Sunday morning while he listened to the church bells ringing. He remembers the time when there was but one

church in this small town, and its bell rang out with a singular meaning and gave direction to the place where one could worship one's deity.

Now he laments the confusion of so many churches ringing their bells at once, calling people

in every which direction to worship a variety of deities. What was once a message has become a cacophony. The confusion of options overwhelms one's freedom of choice.

Many of us grew up in simpler times, in one-bell towns where

the choices and directions were perhaps more limited but certainly easier to recognize. Now, most of us find ourselves living in increasingly information-rich and overcommunicated environments resembling a Hong Kong street with its many neon signs simultaneously flashing their messages. Sure, the senses are stimulated, but almost no information is communicated.

This situation is the result of the conflux of two rapidly developing technologies: electronic computers and telecommunications systems. It is clear that computers speed the flow of information in our lives. This increases the amount of data available to us for each decision we make and ups the number of decisions we must make by increasing the number of options available in various areas.

The speeding up of our envi-

## SCIENCE / SCOPE®

The nation's newest weather satellite has completed the U.S. weather-watch system. The Geostationary Operational Environmental Satellite (GOES) H, launched into orbit over the Atlantic seaboard, provides data for meteorologists to predict and monitor storm fronts threatening the East coast. Designed and built by Hughes Aircraft Company for the National Oceanographic and Atmospheric Administration, GOES H carries two experimental payloads: a space-environment monitor (SEM) for solar-wind measurements, and a receiver designed to aid international search and rescue missions.

Using new technologies, an advanced solid-state laser prototype has been produced that is more efficient and more readily scaled from low to high power than currently available models. The Hughes-built prototype uses optical phase conjugation, ensuring that all light waves emitted are in phase, compensating for aberrations and distortions in a laser beam. Also, the new laser material used, codoped gadolinium scandium gallium garnet, approximately doubles the efficiency and energy storage capacity of the laser. A follow-on contract has been awarded to Hughes for the second and third stages of the U.S. Air Force's Medium Energy Source (MES) program. Future applications of the new laser include communications, range finding, and target designation.

Gate array technology improves the airborne radar performance and increased operational modes for the U.S. Air Force F-15. Pioneered by Hughes, gate arrays are used extensively in the new Hughes APG-70 radar system. They provide the capability to increase the speed of the system's programmable signal processor (PSP) to more than 34 million complex operations per second, five times faster than its predecessor. Gate array technology enables the APG-70 to incorporate operating modes that were unavailable in earlier tactical airborne radars, greatly enhancing the entire F-15/APG-70 weapon system's operational capabilities. The system was developed under contract from McDonnell Douglas, which builds the F-15 for the U.S. Air Force.

Astronomers using a new advanced detector device may discover totally new objects, such as planets around other stars and failed or dying stars. The device, a super-chilled focal plane array, attaches to the bottom of an infrared telescope. It consists of a detector chip and a silicon readout chip that converts energy data into video signals from which television-like images can be produced. The array, developed and built by Hughes, is cooled by liquid helium to -223 to -263 degrees Celsius. This greatly increases the detectors' ability to sense the faint radiant energy of stars being formed and evolving within thick gaseous clouds, known as nebulae.

Hughes Ground Systems Group is applying its airspace management experience to the exciting challenges of worldwide air traffic control. These systems will be designed to ensure service 24 hours a day, 7 days a week. They will support distribution of processing among multiple computers linked via local area networks. The many challenges include design and development of hardware and software to support advanced display and man-machine interface technology, and using satellite technologies for future ATC applications. To help design the next generation of air traffic control systems, send your resume to Hughes Ground Systems Group, Employment Dept. S3, P.O. Box 4275, Fullerton, CA 92634. Equal opportunity employer. U.S. citizenship required.

For more information write to: P.O. Box 45068, Los Angeles, CA 90045-0068

© 1987 Hughes Aircraft Company

**HUGHES**

Subsidiary of GM Hughes Electronics

**M**OST OF US find ourselves living in increasingly information-rich and overcommunicated environments resembling a Hong Kong street.

ronments with nanosecond and picosecond processors may make us more productive, but the resulting "decision crunch" (the reduction of time involved in a normal decision cycle) also increases the stress factor.

### Distorted space

The enhanced speed of computers distorts our sense of time. But the instantaneous and simultaneous "presence" of almost anything made available by modern telecommunications systems distorts our sense of spatial relationships. It results in the loss of our sense of place as well as what former Aspen Institute President Harlan Cleveland calls "the passing of remoteness."

The information-overloaded environment results from the fact that technological developments in information systems have focused on increasing the access to, production of and awareness of information. To deal with the increased volume, speed and availability of information, we must develop the technology for assisting our selectivity and judgment.

At another time, as the speed and power of automobile engines increased, the technologies devoted to braking and steering controls had to keep pace. Had this not been the case, the disadvantages of operating an automobile — such as possible death, injury and destruction caused by machines out of control — would eventually overwhelm the benefits. The technology would cease to be useful and used.

The same must eventually be the case for information technology. Ways of making the technology truly beneficial to human beings must be found, or it will simply be rejected as a part of our daily lives. •

Bossert is manager of strategic information systems at the Hawaiian Telephone Co. in Honolulu.

# FUTURE COMPATIBLE.

Advanced technology ready to work for you today.

At Tandon we feel that our personal computers should not only be exactly compatible with your present needs, but able to meet all your future standards as well.

Our Targa 20, for example, is a powerful 80286-based system with many features not yet available elsewhere.

It comes with a full 1MB of memory and the ability to use it all with our ingenious Memory Management System.

And when Microsoft's Windows 2 operating environment is available, you

can expect it to run even faster than the equivalent PS/2 system.

Large storage capacity, faster processing speed, innovative technology, a small footprint, and the reliability and quality assurance of an industry leader like Tandon.

So whether you need a powerful computer to help you manage your present business, or

use a high-performance state-of-the-art system to keep you compatible with the future, call today.

National 1-800-556-1234 Ext. 171. In California 1-800-441-2345, Ext. 171.

FEATURES	
Processor	80286
Supports OS/2	Yes
1MB Memory	Standard
Memory Management	Yes
Storage	20MB
Small Footprint	Yes



**Tandon**  
Price. Selection. Quality.

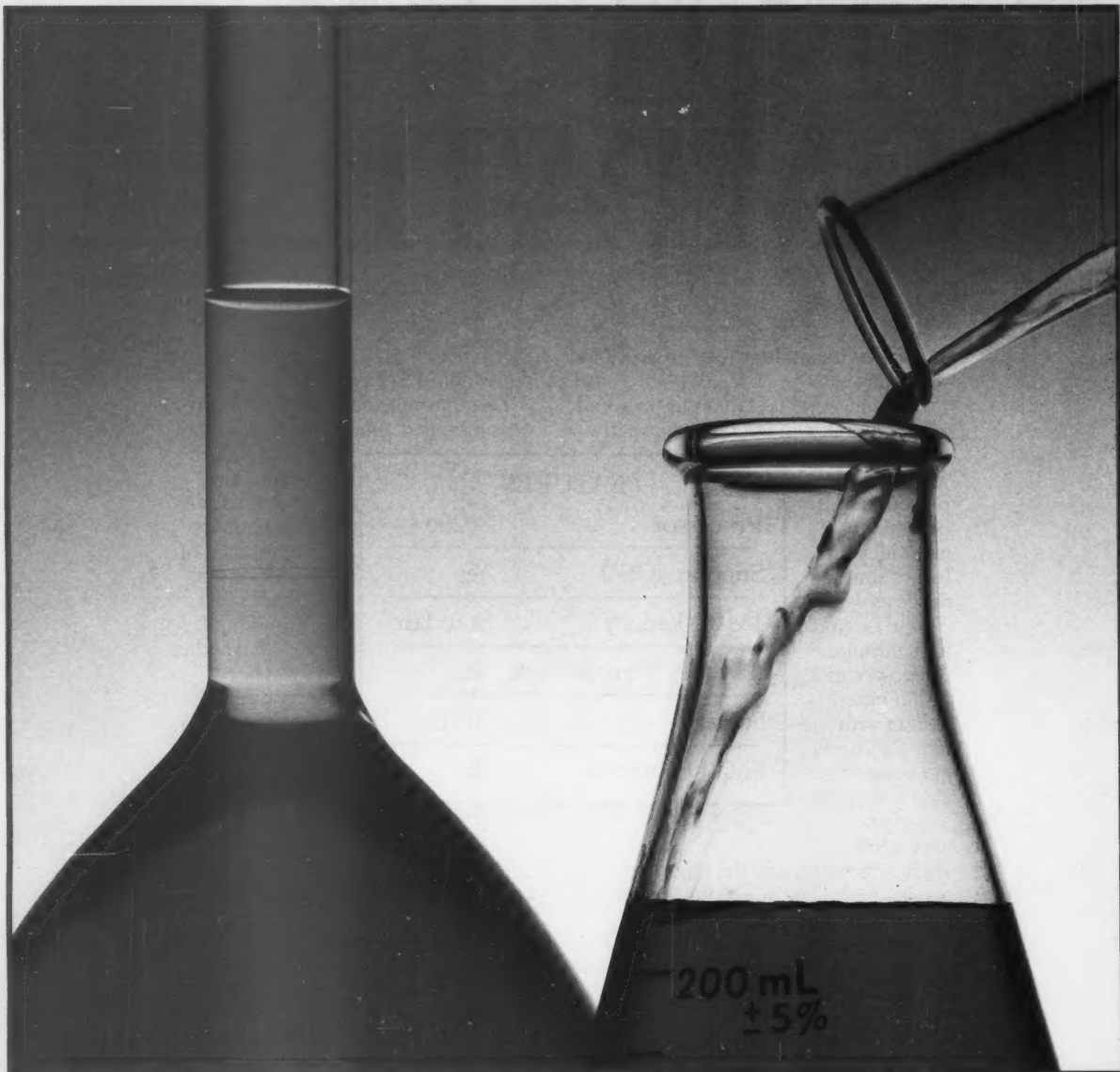
Please send me your Tandon Fact Pac, a comprehensive set of literature and product reviews:

Name \_\_\_\_\_  
Company \_\_\_\_\_  
Address \_\_\_\_\_  
City/State/Zip \_\_\_\_\_  
Telephone \_\_\_\_\_

Tandon Computer Corporation  
405 Science Drive  
Moorpark, CA 93021

CW 10/19

## BURROUGHS WELLCOME FOUND THE RIGHT CHEMISTRY WITH MSA.



For more than a century, Burroughs Wellcome has used their knowledge to create some of the world's finest medicines. And for more than a decade, they have used some of the world's finest software...from Management Science America, Inc.

Burroughs Wellcome makes over-the-counter brands such as Actifed<sup>®</sup>, Sudafed<sup>®</sup>, Neosporin<sup>®</sup> and Polysporin<sup>®</sup>, as well as a wide variety of prescription medicines. And, since 1975, they have made products like these with the help of MSA software.

For years, they had used in-house financial and human resource systems that retained basic information. But that changed after purchasing the MSA Payroll System.

Burroughs Wellcome liked MSA products so well that they subsequently implemented MSA Systems for Accounts Receivable, Accounts Payable, General Ledger, Fixed Assets, and Purchasing. They kept coming to MSA for two prime reasons: reliability and integration.

And whenever Burroughs Wellcome adds an MSA system, they know it will integrate with their other MSA software. That's very important to a company whose sales have more than doubled in the past six years.

Burroughs Wellcome found our software to be good chemistry. So will your company. Call Robert Carpenter, MSA in Atlanta, at (404) 939-9000.

**MSA** The Software  
Company



# MANAGEMENT

## TAKING CHARGE

Doug Zwank

### Legislating high-tech

One of the popular themes at recent computer conferences has been the need for adequate computer crime legislation. Although the federal government and most states have a computer crime statute, there is interest in assessing how effective those laws will be when they are used.

Anyone who has been involved in drafting this type of legislation is acutely aware of how difficult it is to construct in order to keep pace with rapidly evolving computer technology.

A noted expert in the field once said the technology that will be on the market five years from now won't be invented until two years from now. It is, therefore, extremely difficult for most of us to plan for more than a couple of years in the future. This problem is exaggerated when trying to anticipate how the criminal mind will exploit technology.

It is difficult to measure the typical length of time required to enact criminal legislation. But it would be unusual for either the state or federal government to pass such legislation within two years of the time the need or problem is first identified.

The development of high-tech criminal sanctions has the potential for being too little too late. When laws and sanctions are passed, the technology will be outdated. Without a thorough understanding of that technology, many legislators will find themselves chasing the high-tech curve and will never catch

*Continued on page 99*

## Consortium brings home DP training

BY DAVID A. LUDLUM  
CW STAFF

**INDIANAPOLIS** — When officials of the Indianapolis Training Consortium, Inc. recently sought bids from data processing training outfits for the courses they wanted to sponsor, they received 230 proposals.

"It took a committee of five people three days to sort through them," says Stan Piercefield, a founder of the 4-year-old consortium and manager of user and administrative services at Public Service Indiana, Inc.

The response illustrates the success the nonprofit consortium has had ever since a group of local corporate DP trainers — despairing over the lack of course offerings in the Indianapolis area — devised it over lunch

one day.

The Indianapolis group is one of several local nonprofit consortia that sponsor DP training classes. In addition, dozens of local professional associations of DP trainers sponsor courses with varying degrees of regularity.

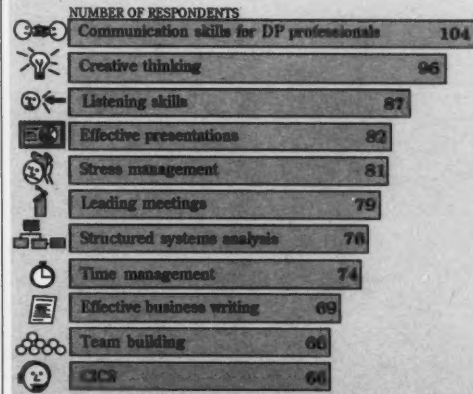
The groups are often in medium-sized cities where commercial DP training is less readily available than in major urban areas, although there are organizations in Boston, Minneapolis and Denver.

By contracting with commercial DP training outfits, the groups can bring the courses their members most want to their area, thus saving members travel expenses. Furthermore, they can often negotiate discounts on tuition rates.

*Continued on page 98*

### Setting course

DP professionals at 32 companies requested a variety of skills from development courses



INFORMATION PROVIDED BY INDIANAPOLIS TRAINING CONSORTIUM, INC.  
CW CHART: AMY J. SWANSON

## Chase banks on Bond

Senior VP juggles 100 data centers, \$650M budget

BY GLENN RIFKIN  
CW STAFF

Elaine Bond's 21st floor office in lower Manhattan offers a breathtaking view of New York Harbor and the Statue of Liberty. But it is unlikely that Bond spends much time gazing at the sights. As senior vice-president for corporate systems at Chase Manhattan Bank NA, Bond oversees more than 100 data centers worldwide, close to 5,000 systems professionals and an annual budget of \$650 million.

Among her responsibilities at Chase — with assets of \$99 billion, it is the nation's second-largest bank — are telecommunications, office automation, systems and personal computing. Her own corporate staff numbers 550.

Bond is the first woman to serve as a senior vice-president at Chase. As the equivalent of its chief information officer, she is not only one of the highest-ranking women at the bank but also among the most powerful in the MIS profession.

### Outside the office

Among the myriad stacks of folders that bury Bond's desk is a 5-in.-high pile of papers relating to her board memberships, advisory roles and chairmanships of countless outside activities that fill to overflowing her already burgeoning life.

Bond is on the board of the prestigious Circle Repertory theater group in New York and the advisory committees of the Carnegie-Mellon School of Urban and Public Affairs and New York University's graduate school telecommunications program. Just last year, she finished serving on the U.S. Department of Defense's scientific advisory

## PROFILE

Elaine Bond



YVONNE HEMSEY/GAMMA LIAISON

**Position:** Senior vice-president for corporate systems, Chase Manhattan Bank.

**Mission:** Steering connectivity, fee-based services and information systems strategy at the nation's second-largest bank.

board. In 1982, *Fortune* named her one of the Top Ten Women in Banking.

Yet, at 52, Bond finds time to play tennis, take long walks on Long Island beaches and attend concerts and the theater with her husband. She spent her summer vacation single-handedly putting an addition on her home. A frustrated engineer — an eighth-grade teacher advised her against engineering as a profession for a woman — Bond likes to paint and make furniture as well as build.

"My main issue," she contends, "is that there are not enough hours in the day."

Bond, who graduated from Tufts University with a degree in mathematics, spends little energy dwelling on her pioneering on behalf of her gender. There simply is not enough time. In

*Continued on page 102*

## Need 308X memory? We're installing now.

When you decide to add mainframe memory, Cambridge Memories is ready with user-proven products. STOR/8000™ universal memory modules fit any 308X, and they're ready to ship and install immediately. Cambridge Memories has provided memory for four

generations of IBM® mainframes, and we've already installed over two billion bytes of 308X memory at sites that include practically all of the 50 largest data processing operations in the U.S. For details, call Ed Breslow or


Michael Brody at (800) 325-5565. (In Mass., (617) 890-6000).

# CAMBRIDGE MEMORIES

A division of Cambex Corporation

Stor/8000 is a trademark of Cambex Corp. IBM is a registered trademark of International Business Machines Corp.





**“The only thing that used to bring this company together was corporate softball.**

*Even then we weren't exactly championship material. You put people in little cubicles, in separate buildings, using separate phone systems and you're bound to end up looking minor league. Something had to change. And it did. When we plugged in that communication system from AT&T. We began cutting costs on redundancies. And started working like a team of pros. Anticipating each other's moves, covering bases. As for our scorecard, would you believe a 9 and 1 season?*

**AT&T comes through.”**



**The AT&T System 85**

With complete networking transparency, AT&T's premier voice and data switch can help bridge the gap between scattered outposts—across the street or across the country.

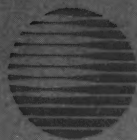
A single System 85, with remote modules, can serve up to thirty locations in a nineteen square-mile ring. While multiple systems can be linked to better serve far-flung operations.

Full feature integration means dispersed offices can share central resources, including AT&T's AUDIX message-recording system. So the investment you make today, will be protected tomorrow.

To learn more, contact your AT&T Account Executive. Or call 1 800 247-1212. And ask about financing through the AT&T Credit Corporation.

From equipment to networking, from computers to communications, AT&T is the right choice.

© 1987 AT&T



**AT&T**

The right choice.



## Consortium

CONTINUED FROM PAGE 95

Stepping into a commercial DP training void, the Indianapolis group has become one of the strongest. Most major employers in the area now belong, and the consortium's strength reinforces itself as it wins discount tuitions.

"Pretty much the consortium has locked up central Indiana. If any training vendor wants to do business in central Indiana, they darn well better go through the consortium," Piercefield says. "We really do a lot of dickering with them to knock the price way down."

Market clout can also help in setting standards for quality. "We've had a couple of vendors whose classes really didn't go well. We leveraged a little pressure, and those vendors refunded the fee," Piercefield says.

The 11 companies that founded the Indiana group each pledged \$500 in seed

money. Officials at one member, a bank, took responsibility for administrative chores for the first year.

Consortium leaders surveyed members on training needs and issued requests for proposals to about 50 training vendors. "Some of the vendors had no idea there was that much demand in the central Indiana area," Piercefield says.

The first year, the group put on 12 classes. Then, as now, they were held at member companies. Employees of non-member companies are welcome to take courses, at a higher fee.

At the end of 1984, the group contracted with a management firm to handle administration. It now has 28 corporate members from a variety of industries; most of them are large IBM shops. This

year, the consortium is sponsoring 24 classes worth more than \$100,000.

Paula Kirby, a Banc One Corp. trainer who helped start the group, transferred to Columbus, Ohio, in 1984 and again found a lack of commercial DP training. "I've just found, by and large, that no vendors came to the Midwest," she says. "I proposed that I be allocated the time to get [a consortium] started here."

The Mid-Ohio Training Consortium, Inc. is also a nonprofit corporation. It still handles its administration through the volunteer efforts of members. Corporate members, now numbering 39, pay a one-time \$500 fee to join, with a six-month money-back trial period. Nonmembers pay a tuition premium of about 20%.

In Richmond, Va., the 7-year-old Rich-

mond Information Systems Educators group is less structured but plans to sponsor 80 to 90 classes next year.

The group is managed by DP trainers volunteered by the core members. "We just pass it around so it's not too burdensome on anyone," says Peter Yeager, training director for the Life Insurance Co. of Virginia, a subsidiary of Chicago-based Aon Corp.

Officials of the group have calculated that it sponsored about \$1.37 million worth of courses at regular prices last year at a cost of about \$350,000 — saving participating companies about \$1 million. "We're able to negotiate good prices from vendors. I think that's because we're able to create a market they otherwise wouldn't have," Yeager says.

## Softening up DP pros

BY DAVID A. LUDLUM  
CW STAFF

In their recent survey of members' training needs, officials of the Indianapolis Training Consortium, Inc. discovered what one calls a dramatic shift toward classes in "softer" management and personal skills rather than technical ones.

"We see that as a real emerging trend," says Stan Piercefield, manager of user and administrative services at Public Service Indiana, Inc.

"The colleges and universities are doing such a great job in preparing professionals, we don't have to teach them Cobol and JCL. They're into fourth-generation languages already at the college level," Piercefield says. "But they don't get the softer skills. They don't really learn how to communicate. What college offers a course in creative thinking?"

Leading the list of requested classes was communications skills for DP professionals, cited by 104 prospective students. The most sought-after technical class, structured systems analysis, ranked seventh on the list with 76 requests (see chart page 95).

DAVID LUDLUM

## EXPORT TO EUROPE

We can organize distribution together with you or for you. Meet us at comdex.

Homan Management BV

The Netherlands

Phone: "31 2155 25473

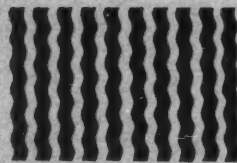
Telex: 41622 Cmail NL

Att: Homan

# VaporCASE

## VaporCASE

The wishful promises of vendors who are trying to jump on the CASE bandwagon. They demonstrate part of the CASE solution, and hope you'll wait until they develop the rest of their system which they promise will be ready "any day now." Meanwhile, even if they could help you develop a brilliant applications strategy, you have no clear way to implement it.



## Piece Parts

Some CASE suppliers offer a small piece or two of the puzzle. A front-end here. A back-end there. Integration? No problem! Just as soon as they can make Company A's front-end work with Company B's repository, and tie everything into Company C's code generators.

STAND  
ALONE  
FRONT-  
END  
TOOLS

CODE  
GENERATOR

COMING  
SOON

DICTIONARY  
COMING SOON

## Projections

One way to evaluate a CASE system is to simply visit the installations where the product is up and running. Most CASE vendors will tell you where their product might be installed in the future...if you don't mind waiting.





## Legislating

CONTINUED FROM PAGE 95

up. This will create a critical gap between the law and technology that will be fertile ground for high-tech thieves and criminals.

This problem can be avoided if the problem is approached from the proper perspective — the changing nature of property. The past decade has often been described as one of a computer revolution, and a void in criminal law has typically been attributed to the computer.

In fact, the real revolution has been an information revolution. The problem with criminal law predating 1980 was that information suddenly became prop-

erty with real and significant value with very little warning and without much preparation.

The old concepts of tangible property that dominated criminal law were derived from the days of the horse and buggy. Livestock was valuable property, and the dollar was based on the gold standard. Property could be easily defined and identified.

With the sophistication of modern businesses and vehicles of finance, possession of tangible property often has little significance in terms of who actually has title to the property. Rather, the electronic binary digits stored in a bank or mortgage company determine who owns the property and its market value. This property — the information of title

— has real value. This is especially evident in shared property such as large limited partnerships and common-stock companies, where direct ownership is difficult to apportion. The numeral "1" in place of where a "0" should be or vice versa could make a difference of \$1 million in readily convertible liquid assets.

Liability can be affected as well. Debt obligations and the responsibility for damages can be altered through data manipulation.

Information in modern society is extremely important. How that information is transported, stored and manipulated is also important. Simple access to information can be critical. Additionally, untimely disclosures of various financial transactions can have a tremendous impact on

the marketplace.

Another aspect of the information revolution is a change in the type of information that has become valuable. Client sales and mailing lists and demographic data on individuals' incomes, hobbies and employment all have applications in marketing and thus have value.

Before the past several decades, we didn't think in terms of this information having significant value. For it to be useful required labor-intensive manual systems.

Now, the information that was processed in days is handled in seconds. The output that had to be handwritten or typed is now automatically generated on printers. The speed and volume at which information can be processed has changed that information into something of value.

### Staying ahead of the game

Therefore, those who design statutes around the tool rather than the property will probably always be trying to enact laws to cover aging technology.

The real effort in modernizing our criminal codes will be the challenge to redefine property and its nature. Whether we want to accept it or not, information is property in the same way as the computer that processes it. Civil and criminal law must quickly be revised to support this new concept of property if society wants to deter future disasters of overwhelming proportions.

We need to define intangible property such as knowledge and data, both in a stored format and in the intellectual format.

We need to determine when proprietary interests can be assigned to that property. How can that interest be recorded? We need to define how value is established, what has value and whether the value of information is static or dependent on its location or on what is being done with it.

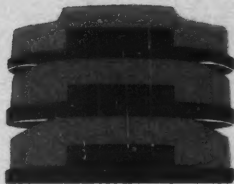
These issues and questions may seem unlimited and overwhelming, but they must be addressed, and soon.

We are living in the information age. Computers are only the wagon we rode to get here.

Zwank is chief of the Information Systems Division at the Federal Law Enforcement Training Center in Glynco, Ga.

# S PACBASE™

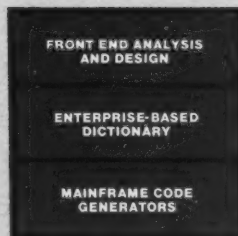
## CASE Software



PACBASE is the completely proven, totally integrated, full life cycle CASE system that addresses the strategic concerns of MIS Directors. It speeds applications analysis and design, and eliminates the delays and the expense of applications maintenance... all helping to increase the MIS response for key business applications. No vague promises. No smoke. Just the reality of the proven CASE solution.

## Architecture

PACBASE is the standard for the full life cycle CASE solution. It is a seamless integration of methodology independent analysis, prototyping and programming facilities with an active enterprise dictionary and automated generators. PACBASE produces complete COBOL programs, database descriptions, screen maps, integrated on-line help and documentation directly from design specifications. All portable across a wide variety of hardware, operating environments and DBMS's, (including DB2)... IBM, Honeywell and UNISYS. All automatically maintainable at the specifications level. MIS Directors who understand the CASE problem recognize PACBASE as the total CASE solution.



## Installations

There are over 500 PACBASE installations worldwide serviced and supported by a staff of over 1400 CGI professionals. Closer to home, there are nearly 100 installations in the U.S. that you can see today. So instead of listening to someone else's projections, visit one of our installations. Why wait any longer for the bits and pieces to come together. Call CGI Systems today for complete information about PACBASE... the complete CASE solution:

1-800-PAC-1866

PACBASE: Seeing is Believing



## Show Me!

For a live PACBASE Executive Presentation that blows away all the vaporCASE, simply write PACBASE on your business card, send it to our Marketing Dept., and we'll contact you to arrange a date that's convenient for you.



CGI Systems, Inc.  
One Blue Hill Plaza, P. O. Box 1645  
Pearl River, NY 10965 (914) 735-5030

**ZENTEC &  
LEAR SIEGLER  
TERMINALS**

**REPLACEMENT PARTS  
AVAILABLE NOW.**

From The Only Authorized Source

**24-Hour Delivery Call Now  
Anywhere In The U.S.**

**DOW JONES SERVICE  
1-800-532-7373**

# WHY CHASE MANHATTAN OPENED ITS ACCOUNT WITH 3Com.



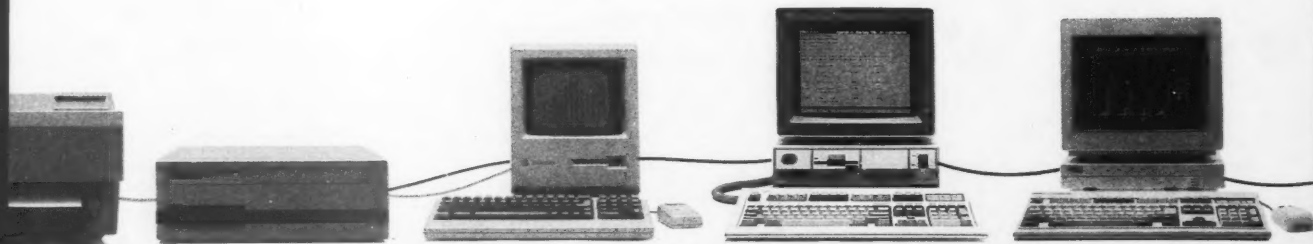
When one of the world's biggest banks decided to network its Corporate Services Group, the long term implications of such a decision meant that every option had to be thoroughly investigated.

Whatever the final decision, it had to be an investment that both the group and the bank could live with for a long, long time.

Rejecting mainframe/mini/terminal configurations for cost reasons, they decided a PC-based workgroup system was the answer.

Chase's Corporate Services management chose 3Com's 3System, supplied and supported by a 3Com Authorized Dealer.

The 3System for Chase's Corporate Services links five buildings in the Wall Street area and will eventually expand to facilities in upstate New York. Multiple 3Servers run 3+ operating software and 3System's superior electronic mail to multiple users.



3System also allows network users entry to the bank's IBM mainframes via Bridge Communications gateways. Data can be downloaded to the 3Servers and then accessed by any member of the workgroup.

And because of 3System's security, managers and other administrative staff can share data and handle the most confidential of business transactions.

Like other 3System users, Chase Corporate Services Group found it could run an almost limitless choice of application software on its network.

They chose "Smart," an integrated package combining database, word processing and spreadsheet, the "Higgins" workgroup personal productivity program and DNET Menuing software.

Since it has been installed, 3System has had no downtime. And

because all data is backed up nightly, there hasn't been a single instance of lost data either.

Other major Wall Street financial companies like Chemical Bank of

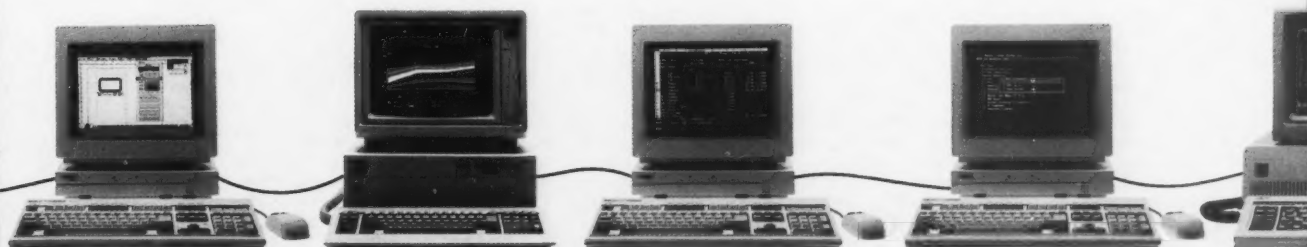
New York, Shearson Lehman/American Express and Merrill Lynch share Chase Corporate Services Group's enthusiasm.

That's why they've also opened accounts with 3Com.

For your nearest 3Com dealer, call 1-800-NET-3Com.



**3Com<sup>®</sup>**  
**WORKGROUP SYSTEMS**



SmartWare is a registered trademark of Innovative Software. Higgins is a trademark of Conetic Systems, Inc. DNET Menuing is a trademark of Delta Technology International, Inc.



## Chase's Bond

FROM PAGE 95

1981, after 23 years at IBM — most recently as group director of information systems at the White Plains, N.Y., data processing complex — she came to Chase with a mandate to put order into a chaotic systems strategy.

### Sobering experience

Coming from the technologically pristine world of IBM to Chase was more than a sobering experience. "I went through a version of 'Oh my God, what did I get myself into?'" Bond recalls. "I also was very excited because I saw an opportunity to make a difference." At IBM, Bond says, there is an intuitive understanding of what data processing can do for a company.

"IBM's internal commitment to the use of data processing is more sensitized and pervasive than at Chase," Bond says. "At Chase, everyone will say 'yeah, technology is important,' but there is not the same level of intuition about what technology can do for you."

Bond left IBM, despite a comfortable and happy working relationship, for what she calls "the attraction of change." She gets restless without a challenge. "I'd gotten to a point where I knew IBM well, and the one thing I hadn't done in my life was see the data processing world from a customer's point of view. I thought if I was ever going to make a change, that was the time to do it," she says.

The challenge was bigger than she anticipated. Bond discovered that the financial services industry in general was only beginning to understand the importance of information flow, from traditional lending-type applications to more strategic use of information to boost the bottom line.

### 'Open territory'

To make matters worse, Bond came to Chase just as the decision had been made to decentralize all of the bank's operations. That triggered a wave of enthusiastic yet catastrophic systems euphoria as each newly freed-up business unit moved quickly, without direction, to set up its own shop. The bank had no preferred vendor list or a coherent strategy. "It was truly an open territory, I kid you not," Bond says. "Whatever anybody wanted to do, they were free to do."

In fact, while Bond found little resentment toward her gender, there was open dismay that she had come from IBM. The bank was moving away from big DP centers, minicomputers were appearing everywhere and, among the technical people, it was in vogue to be anti-IBM. "We had one of everything that was ever built by any vendor anywhere," Bond laughs.

Bond, though admittedly biased toward IBM, eschewed the option of nailing down corporate dictates in favor of a more flexible, supportive approach. She emphasizes that patience was the key. She says the tactic worked. "Wisdom has settled in. What we did was pick our places

to influence. We didn't lay down edicts that said 'you can't.' We said, 'Here is what we are supporting, this is what we recommend.'"

Through that process, Chase acknowledged it was a multivendor shop and settled on the following three main suppliers: Wang Laboratories, Inc., Digital Equipment Corp. and IBM.

### Still reaching

Nearly seven years later, progress has been made, but Bond says she believes that she is still only a third of the way toward her goal. "What I'm seeing now is the awakening to data movement, to interconnection, to sharing," she explains. The varied, autonomous units, now past the initial frenzy of installation, are starting to seek out ways to interact with other processes in the bank.

"We're beginning to live with the issues of interconnectivity," Bond says. "Everyday, we're growing the interconnect capability, which is making more people become believers. We're still in the growth stage, but I'm comfortable that it's implanted, it's nurtured, and it's growing. In a short time, I'm convinced that a central catalyst won't even be needed. It will grow of its own accord."

Bond's work and abilities have earned praise from her colleagues. "Her greatest strength is understanding the issues surrounding the use of technology and how hard it is to change," says Bob Reffelt, a consultant with EST Prototypes, Inc. in Midland Park, N.J., and a former Chase vice-president. "Her biggest concern is the fact that most organizations underestimate what is involved in going from today to tomorrow."

Bond has earned a reputation as a "roll up the sleeves, get it done" personality, according to Chet Delaney, vice-president and human resource officer for the systems group.

Aside from the responsibility of implementing specific services, Bond also oversees a wide variety of support services. These services are paid for by the individual business units.

She also helps steer corporate strategy in relation to the systems impact on the bank's business.

"Her most consistent theme is to keep individual ideas in a larger context. No matter how neat the technology is, she always wants to know how it fits into Chase as a whole," Delaney says.

Reffelt adds, "She knows how to take the message to the people at the top and to explain the kind of investment needed for the transfer of technology."

### Not an uphill battle

Bond bristles at the suggestion that Chase is fighting an uphill battle against No. 1 Citibank NA,

which has been pegged as the leading innovator in the use of technology in banking (see story below).

Delaney credits Bond with making genuine progress in connectivity and applications data bases. But most of all, she has pushed to the limit the idea that services should sell themselves.

To this end, Bond continues to advocate fee-based services which, over time, reduce the amount of budget required from computer services to support those functions.

In addition, Bond designated one of the DP centers as a corporate hub for internal data centers that need to be a gateway to other data centers with dissimilar computer systems. "We are interconnecting all of our DP centers across multivendor lines," Bond says. "And this one center, in order to be in business, must convince all the other DP centers to buy its services."

Rather than looking to maximize profits, Bond's "DO" units, as she calls them, are trying to exist by offering the best price/performance available either inside or outside of Chase.

She insists that the internal selling does not create conflicts. What is difficult, however, is finding technical people who like that mix of business responsibilities. "Good technical people like to work on technical things and don't like to worry about business," Bond laments. Nonetheless, the DP center program has created a "fraternity" of data center managers. The program has become very successful because the managers review each other and set their own standards.

### Challenges still ahead

Bond realizes that she still faces serious challenges before she can reach her goals. Her ever-growing staff, she says, shares the vision, knows what it wants to do and believes in the goals. But Bond is in no rush to push the plans beyond their limits. "If you go out and sell too soon, you create expectations that you may not have the manpower and infrastructure to deliver; you could have sharpshooters working against you."

When the challenge is gone at some future point, Bond may be as well. She would like to take on the challenge of being a chief executive officer in a software or DP business. "That's my strength, that's what I've got really good skills at," she says. "I can be snowed, but it takes a lot to snow me."

For now, the challenge at Chase remains strong. "I expect another two or three years of the intensity with which we're going at it now," Bond says. "I can see little light bulbs going on all over the place. You just know that once you've got their soul, heart and mind, the rest of the body is going to follow."

## Chase vs. Citibank

Chase Manhattan Bank NA's Elaine Bond admits to getting flak from the bank's top executives about Citibank NA's reputed technological edge.

"Do we hear comparisons to Citibank? Yes, sure. But my conviction is that application for application, I'm not aware that they are doing anything more than we are doing. Citibank is a pioneer, and they are very good at getting a lot of ink for the things they do. But I'm not aware of very many things they are doing that most of the other institutions are not doing, perhaps on a different scale, certainly with a lot less publicity," she says.

Citibank's early embrace of automated teller machines won them deserved kudos, Bond acknowledges, but in other areas, such as satellites, it is difficult to distinguish the hype from the hope.

"[Citibank] got a lot of ink for buying their own satellites, but so what? That, to

me, was jazz," she states defiantly. "It's not clear that owning satellites as a technology is needed or desirable. Our own analysis was that satellites have a finite life... government subsidies to put them up are going to end, they are going to get increasingly more expensive, and that fiber technology is coming so that it will be very competitive immediately. So from our point of view, satellites were not terribly exciting or needed," she says.

Bond credits Citibank leaders such as Walter Wriston and John Reed for their vocal support of technology in the marketplace, a support that embellishes the image. But Chase is content to take a more conservative, grass roots approach toward technology future. "You have to map to the expectations of your corporation and culture. Flash is not us."

GLENN RIFKIN

## CALENDAR

OCT. 25-31

**Artificial Intelligence and Advanced Computer Technology Conference and Exhibition.** Atlantic City, Oct. 28-30 — Contact: Tower Conference Management Co., 331 W. Wesley St., Wheaton, Ill. 60187.

**Rothchild Consultants' TOC Conference on Optical Storage for Small Systems.** Millbrae, Calif., Oct. 28-30 — Contact: Rothchild Consultants, 256 Laguna Honda Blvd., San Francisco, Calif. 94116.

**Computer Dealers and Lessors Association Joint Meeting with the European Computer Dealers and Lessors.** Bermuda, Oct. 28-31 — Contact: CDLA, Inc., 1212 Potomac St. N.W., Washington, D.C. 20007.

**Computer-based Training and Interactive Video.** Chicago, Oct. 29-30 — Contact: Registrar, Battelle Seminars Program, P.O. Box C-5395, 4000 N.E. 41st St., Seattle, Wash. 98105.

**Mumps Users' Group.** Washington, D.C., Oct. 29-31 — Contact: Mumps Users' Group, Suite 510, 4321 Hartwick Road, College Park, Md. 20740.

**Ninth Annual Computer Law Institute.** Washington, D.C., Oct. 29-31 — Contact: Practising Law Institute, 810 Seventh Ave., New York, N.Y. 10019.

NOV. 1-7

**Eleventh Annual Symposium on Computer Applications in Medical Care.** Washington, D.C., Nov. 1-4 — Contact: Registrar, SCAMC, Office of Continuing Medical Education, The George Washington University Medical Center, 2300 K St. N.W., Washington, D.C. 20037.

**Third Annual Accelerator User Conference.** Boston, Nov. 1-4 — Contact: Index Technology Group, One Main St., Cambridge, Mass. 02142.

**International Software AG Users' Conference.** Miami, Nov. 1-5 — Contact: Software AG, 11800 Sunrise Valley Drive, Reston, Va. 22091.

**Conference on Expert Systems Technology in the ADP Environment.** Washington, D.C., Nov. 2-3 — Contact: Lloyd F. Arrowood, Program Chair, Oak Ridge National Laboratory, 4500 North, Mail Stop 207, Oak Ridge, Tenn. 37831.

**The Supergroup (HP 3000) Users Conference — East.** Washington, D.C., Nov. 2-4 — Contact: Supergroup Association, 348 E. South Temple, Salt Lake City, Utah 84111.

**Data Processing Management Association International Computer Conference and Business Exposition.** San Francisco, Nov. 2-4 — Contact: DPMA, 505 Busse Highway, Park Ridge, Ill. 60068.

**Electronic Imaging '87.** Boston, Nov. 2-5 — Contact: Institute for Graphic Communication, 375 Commonwealth Ave., Boston, Mass. 02115.

**Comdex/Fall '87.** Las Vegas, Nov. 2-6 — Contact: Keith F. Westerman, The Interface Group, Inc., 300 First Ave., Needham, Mass. 02194.

**Managing Change in Information Resources Management.** Crystal City, Va., Nov. 3 — Contact: Cathy Hirsch, American Management Systems, Inc., 1777 N. Kent St., Arlington, Va. 22209.

**The First International Videotex Forum.** Paris, Nov. 3-4 — Contact: International Videotex Industry Association/AFTL, 131, avenue de Wagram, 75847 Paris Cedex 17.

**Information Systems Trainers Fall Conference and Trade Show.** Denver, Nov. 5 — Contact: Ron Barela, 8878 South Allison St., Littleton, Colo. 80123.





# Network your way to success!

Learn from one of the nation's leading telecommunications professionals — attend an In-depth Tutorial at CN '88!

## Communication Networks '88

**Place:** Washington D.C.  
Convention Center

**Tutorials:** Monday, Jan. 25

**Conference**

**& Expo:** Tuesday-Thursday,  
Jan. 26-28

### CN '88 — your network for success

Celebrating a decade as the industry's elite voice and data show. This year's Communication Networks will be the biggest show ever. In an exciting atmosphere of new product introductions, late-breaking news, exhibits, demonstrations and 75 hour-long conference sessions, you'll get the latest word on all aspects of voice, data, and telecommunications equipment, services, software and management solutions.

Most important of all, CN '88 provides your best educational opportunity of the year. CN's full-day, university-level tutorials help you bridge the gap between today's rapidly emerging technical and managerial possibilities and your ability to put them to work for you.

No matter what level of experience you have, you'll find the basic or advanced tutorial you need. Led by a top telecom professional, each tutorial gives you knowledge it would take years of trial-and-error to learn on your own. Plus, completion of a tutorial qualifies you for Continuing Education Credits and certificate.

**Register now to guarantee your place at the tutorial of your choice. Complete this enrollment form and mail it today!**

Last year's tutorials were filled to capacity. Don't risk disappointment. Register now!

Make your success a priority in 1988. Choose the tutorial now that will profit you the most.

**For immediate information  
call  
(800) 225-4698**

#### T-1 PLANNING INTEGRATED CORPORATE NETWORKS

**Leader:** Dr. John McQuillen, President, McQuillen Consulting

This intensive, one-day seminar instructs you on planning issues for integrating packet, circuit, and channel switching; SNA and X.25; and voice and data in a corporate network strategy. You will address the role ISDN will play, as well as enterprise-wide networking and bandwidth-intensive applications.  
**Level:** Intermediate.

#### T-2 MULTIVENDOR MULTIARCHITECTURE LANS: MAKING THEM WORK

**Leader:** Dr. Kenneth Thurber, President, Architecture Technology

Attend this tutorial for a comprehensive overview of today's LAN environments. Discussion will include how to tie diverse and often incompatible network elements together in a manageable, logical way, as well as alternatives to LANs.  
**Level:** Advanced.

#### T-3 ISDN: STANDARDS, PRODUCTS AND SERVICES

**Leader:** James G. Herman, Independent Consultant, formerly with the Telecommunications Consulting Group at BBN

ISDN is fast approaching. Some say with too little agreement on fundamental standards and applications. Attend this highly focused, intensive session to anticipate the emerging standards, vendor trials, conflicts, successes, products and service offerings that will emerge over the next several years.  
**Level:** Intermediate.

#### T-4 MULTIVENDOR NETWORK MANAGEMENT

**Leader:** Jerry McDowell, Vice President, Vanguard Telecommunications Inc.

Enroll in this intensive tutorial for skills in managing a network which links multiple carriers, including those on the same circuit, and a variety of hardware and software vendors in one corporate network. You will learn how to take control into your own hands and avoid finger pointing, acrimony and poor service.  
**Level:** Intermediate.

#### T-5 HOW TO BECOME A BETTER TELECOMMUNICATIONS MANAGER

**Leader:** Gerald P. Ryan, President, Connections Telecommunications Inc.

Today's network manager must understand not only new technologies and standards, but must play many roles in the company. Attend this instructive tutorial for an entertaining and thought-provoking look at what you need to know to be a successful network manager, plus the tools, processes, and organization that will maximize your efficiency.  
**Level:** Intermediate.

#### T-6 THE LATEST LOOK AT NETWORK STANDARDS AND OS

**Leader:** Richard deJardins, Director of Technology R&D, Computer Technology Associates Inc.

As OSI and the older standards are reaching maturity, numerous new standards are in the works. Attend this intensive session for a look at the new generation of standards — including their purpose, significance, applications, and technical elements.  
**Level:** Introductory.

#### T-7 MODELING AND DESIGNING VOICE AND DATA NETWORKS

**Leader:** Dr. Wushow Chou, Professor of Computer Science and Electrical and Computer Engineering, North Carolina State University

Enroll in this tutorial for detailed instructions on how to design integrated networks. You'll learn about combining voice and data on a single architecture to maximize the efficiencies of wideband services, the migration from classical multipoint to distributed systems, plus cost-efficiency issues and other practical considerations.  
**Level:** Advanced.

#### T-8 NETVIEW: INDUSTRY-WIDE IMPLICATIONS

**Leader:** Atul Kapoor, Vice President, Kaptronix Inc.

This tutorial gives you a thorough and comprehensive introduction to IBM's NetView and NetView/PC — their operation, technical specs, dependences and functional interactions, plus an analysis of their impact on the industry, significance for users and practical suggestions for implementation.  
**Level:** Intermediate.

#### T-9 OPEN-NETWORK ARCHITECTURE: CARRIER VENDOR USER IMPLICATIONS

**Leader:** Haines Gaffner, President, LINK Resources Corp.

The FCC has ordered AT&T and the RBOCs to adopt ONA to stimulate competition in enhanced data processing services over public switched networks. Enroll in this tutorial to learn the details of the ruling, its implications for service offerings and an overview of who the players will be.  
**Level:** Intermediate.

#### T-10 INTERNATIONAL NETWORKS: SOLVING THE PRACTICAL PROBLEMS

**Leader:** Len Ellenbein, President, Telcom Systems Group

Attend this tutorial if your company is expanding its network outside the U.S. You'll receive immediately useful information on tariffs, rules, how to handle ordering and service delays, the role of the PTIs, how to deal with the lack of consistency from country to country, and many more issues you must confront to succeed.  
**Level:** Intermediate.

#### T-11 BUILDING THE NETWORK CONTROL CENTER

**Leader:** Gabe Kasperek, President, Kazcom Inc.

This one-day course will help you successfully operate a network control center on a day-to-day level. You will focus on the practical requirements, functions to be performed, systems and tools available and how to put them all together to gain control over your network.  
**Level:** Introductory.

#### T-12 REGULATORY ISSUES AND ANSWERS

**Leader:** Richard E. Wiley, Senior Partner, Wiley, Rein & Fielding

Take this comprehensive seminar to make sense of the increasingly complex regulatory environment. You will receive a thorough briefing on the legal, social and regulatory issues; the evolution of vendor technology and industry standards and significant developments affecting the coming regulatory year.  
**Level:** Intermediate.

#### T-13 INTRODUCTION TO DATA COMMUNICATIONS

**Leader:** Gary Audin, President, Delphi Inc.

This perennially popular tutorial provides exactly the right mix of concept, technology, and application for the beginner to get a good foundation in data communications. The course notes are excellent reference material and the instructor is one of the most highly regarded professionals in the industry.  
**Level:** Introductory.

#### T-14 INTRODUCTION TO VOICE COMMUNICATIONS AND PBX

**Leader:** James Morgan, Principal, J.H. Morgan Consultants

Enroll in this full-day tutorial for a comprehensive foundation in the basics of voice communications — technology, PBX characteristics, switched networks, tariffs, and services, as well as an overview of traffic engineering.  
**Level:** Introductory.

#### T-15 IMPACT OF THE NEW POST-DIVESTITURE TARIFFS ON LARGE NETWORKS

**Leader:** Robert L. Ellis, President, The Aries Group

In this intensive tutorial you will learn the structure of the post-divestiture tariffs, the latest January 1988 changes to these tariffs, how to price interstate private lines, how to configure and price interstate FX services, the new economics in configuring data networks, the LATA-pure strategy and federal access tariffs and how to use them.  
**Level:** Intermediate.

#### Choose one and indicate tutorial number:

☐ All four days at CN '88, including one In-depth Tutorial (Jan. 25) indicated below and full admission to the three-day Conference and Expo (Jan. 26-28) including seminars and exhibits.  
In-depth Tutorial No. T-..... \$695.00

☐ The three-day Conference and Expo (Jan. 26-28)..... \$495.00

☐ The all-day In-depth Tutorial (Jan. 25) indicated below, including admission to exhibits (Jan. 26-28).  
In-depth Tutorial No. T-..... \$295.00

☐ One day at CN '88, including admission to the Conference and Expo. Reserve space for me on:  
Tues. Wed. Thurs. .... \$195.00  
Circle one

☐ Please send me more information on Communication Networks

Card No. \_\_\_\_\_

Expiration Date \_\_\_\_\_

Signature \_\_\_\_\_

☐ Check enclosed ☐ Bill me ☐ Bill company P.O. #

☐ American Express ☐ MasterCard ☐ VISA

Name \_\_\_\_\_

Title \_\_\_\_\_

Company \_\_\_\_\_

Street \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Telephone ( ) \_\_\_\_\_ Ext. \_\_\_\_\_

Note: All prices include lunch.

NWWS CWS

Return Registration Form to: CN '88, P.O. Box 9171, Framingham, MA 01701-9171. Or call TOLL FREE 800-225-4698.

# Too often a top-rated reputation can be overshadowed by misconception.

You can now get a top-rated stat mux from Codex for as little as \$1,250.

**T**hese days anything that comes with the top rating in its field also comes with the perception that it's very expensive.

And while that's true of many things from cars to clothing, it's not true of statistical multiplexers. Because while both the 1986 *Data Communications* survey and the Market Information Center's 1986 Multiplexer Market Study rated Codex number one overall, you can get one of our economical stat muxes for as little as \$1,250.

So now companies of all sizes can get the quality, reliability, and ease of use that Codex is famous for. With the same support and service we offer even the largest networks.

These economical stat muxes

The Codex 6015 supports 16 devices.  
The Codex 6003 supports 8 devices.




are designed to improve the operational efficiency of smaller networks by merging the information from up to 16 synchronous or asynchronous devices. They're incredibly easy to use, provide error-free transmission, and can save you money on line costs whether you're working with a simple point-to-point configuration, or tying into a larger network.

To find out about Codex 6000 Series stat muxes, call 1-800-426-1212, Ext. 235. Or write Codex Corporation, Dept. 707-35, 7 Blue Hill River Road, Canton, MA 02021-1097. You'll

discover when  
you talk to Codex,  
high quality  
doesn't mean  
high prices.

**codex**  
 **MOTOROLA**

The Networking Experts

Sales offices in more than 40 countries worldwide. In Europe call 32-2-6608980, in Canada call 416-793-5700, in the Far East 852-5-666706, (in Japan 81-3-5848101), in the Americas 617-364-2000.  
© 1987 Codex Corporation. Motorola and  are trademarks of Motorola, Inc. Codex is a registered trademark of Codex Corporation.

Visit Codex at COMDEX/Fall, November 2-6, booth #1890

# COMPUTER INDUSTRY

## INDUSTRY INSIGHT

Clinton Wilder

### IBM turning too slowly?



A popular metaphor for IBM over the past couple of years has been "the bigger the aircraft carrier, the more difficult it is to turn it around." As IBM continues its slow recovery from the flat revenue and decreased earnings of its recent past, most of its customers, stockholders and followers seem to be willing to accept that metaphor.

But in an industry where the currents keep changing faster, just how committed are IBM's pilots to changing the company's fundamental direction?

IBM has built a \$50 billion business on customers whose modus operandi matched the vendor's initials: I Buy Mainframes. But does the world's most profitable corporation understand that an increasing number of information systems executives feel that mainframe computing may not be the best way to serve many of their companies' MIS needs?

At the Alex Brown & Sons Computer Services Seminar in Baltimore earlier this month, IBM Application Software Division Vice-President Bob Berland gave a glimpse of the firm's philosophy. In a question-and-answer session, Berland engaged in a lively exchange with a New York venture capitalist who questioned IBM's commitment to working closely with software partners whose added value would not necessarily help IBM sell more mainframes.

When the questioner cited a large auto parts distributor's forsaking of mainframes for microcomputers for its corporate applications as evidence of a trend, Berland said flatly, "I don't agree with you. It is still more efficient to handle large amounts of data in a central processor instead of stuffing it onto micros." Berland challenged the questioner to "talk to our customers who are buying 3090s like cookie cutters."

On the surface, Berland is not wrong. The case of a user company scrapping its mainframes for local-area networked micros is an extreme one; and

*Continued on page 109*

## NCR, net firms gain in quarter

Most vendors' results strong; NET notches 446% income boost

BY ALAN J. RYAN  
CW STAFF

Many computer industry vendors continued to make impressive financial gains in segments such as communications in the third quarter, but hardware migration, prompted in part by the IBM Personal System/2 announcements earlier this year, have created problems for others.

Hard disk drive vendor Seagate Technology, Inc. reported an income drop of nearly 40% in the quarter.

Microprocessor vendor Advanced Micro Devices, Inc. (AMD) reported a loss of nearly \$54 million, although much of it was attributable to the acquisition of Monolithic Memories, Inc.

Communications products manufacturer Network Equipment Technologies Corp. (NET) caught the wave and rode it to the shore with a 446% increase in its net income over the third quarter last year.

Companies that reported quarterly results last week in-

cluded the following:

• **NCR Corp.** The Dayton, Ohio-based systems manufacturer recorded a 40% gain in earnings per share for its third quarter, ended Sept. 30.

NCR spokesmen said the per-share gain was the largest for

any quarter since 1978, but analysts pointed out that the comparison was against a depressed quarter for per-share earnings last year.

For the period, NCR reported a 14% gain in sales, which were \$1.34 billion, compared with

### 1987 third-quarter earnings

AMD and Seagate Technology profits take a dive, while DCA, Silicon Graphics and NET ride high

Company	Net income July-Sept. (millions of dollars)	Percent change from 1986	Revenue July-Sept. (millions of dollars)	Percent change from 1986
AMD <sup>1</sup>	(\$53.8) <sup>2</sup>	—	\$260.9	+13
ADP	\$30.4	+19	\$361	+13
DCA	\$8.9	+117	\$50.2	+27
Intergraph	\$18.4	+19	\$157.1	+4
Micom Systems	\$3.5	+34	\$52.8	+9
Miniscribe Corp.	\$8.4	+38	\$103.8	+117
NCR	\$97.8	+33	\$1.3B	+14
NET	\$4.2	+446	\$20.5	+91
Seagate Technology	\$14.8	-39	\$226	+20
Silicon Graphics	\$2.9	+70	\$28.9	+77

<sup>1</sup> Reported loss of \$43 million in 1986

<sup>2</sup> Parentheses indicate loss

CW CHART

\$1.2 billion in the like quarter of 1986.

Income for the quarter was \$97.8 million, up 33% from NCR's earnings of \$73.4 million in the third quarter last year.

Earnings per share climbed to \$1.05, compared with 75 cents in the similar quarter last year.

According to analyst Peter Labe of Drexel Burnham Lambert, Inc., NCR's fourth quarter results should be favorable as well.

One reason behind the large percentage increase in earnings, the analyst said, is the fact that "the company had a far worse quarter a year ago than they were expecting."

For 1988, Labe forecasted a 14% revenue gain and a 17% increase in earnings for NCR.

"I think they have the products and the programs to maintain double digit growth," the analyst said.

*Continued on page 110*

### Inside

- IBM creates VAN venture with French firms. Page 107.
- Ford acquires U.S. Leasing. Page 107.
- Counterpoint negotiates alliance with Taiwanese firm. Page 108.

## Micropolis at a crossroads

BY JAMES A. MARTIN  
CW STAFF

CHATSWORTH, Calif. — In an industry littered with the legends of companies whose supposedly leading-edge technology produced market failures, hard disk drive maker Micropolis Corp. has been a consistent success. But with new technologies such as 3½-in. and optical disks emerging, some observers wonder if the conservatism that has kept Micropolis on top will leave it behind in the future.

"They haven't exactly walked the plank with new product forms," says Jim Porter, president of Disk/Trend, Inc., a Mountain View, Calif.-based storage consulting firm.

Micropolis's product strategy is founded on the principle of "sticking to what you know best," according to Chet Baffa, senior vice-president of marketing and sales. "We've not established a reputation as a leading edge company," he says. "We don't have a broad product line, and we don't want one."

The key to success in the Winchester hard disk drive industry, according to Micropolis officials, is to keep prices down

and to sell a small family of products to a large variety of customers.

Micropolis has enjoyed 50% annual revenue growth rates for several years in a row as a result of this simple philosophy. At



Micropolis's Mabon

present, the company offers only three products, all of them 5¼-in. hard disk drives with capacities ranging from 85M to 380M bytes. Pricing is aggressive, as Micropolis manufactures most of its own components and is able to maintain economies of scale in its California and Singapore manufacturing facilities.

But Micropolis has been criticized by some for dragging its

*Continued on page 109*

## McDonnell Douglas slashes 290 info jobs

BY JEAN S. BOZMAN  
CW STAFF

ST. LOUIS — McDonnell Douglas Corp. is restructuring its unprofitable Information Systems Group (ISG), laying off hundreds of employees in a reorganization that began in September and continues until next month.

So far, 290 employees have been laid off in various McDonnell Douglas sites around the country, leaving ISG employment at 11,500. By next month, an additional, undetermined number will also be laid off, with the result that overall ISG employment will have been reduced by 3% to 5%.

ISG has lost money in each of the last two years despite annual revenue of more than \$1 billion.

Word of the layoffs trickled out of the McDonnell Douglas facility here last week, even though the company had tried to keep the reorganization low-key. The move had been announced to McDonnell Douglas employees Sept. 24 through a 25-minute videotaped speech by Jeremy J. Causley, group executive

officer of the Information Systems Group.

"After a one-year period of investigating the ISG organization, it has become apparent that some of our operations are investing too much in the context of earnings we expect," Causley told employees. "Our goal is to conduct our business more efficiently."

Executives within each of ISG's eight business units have the power to implement the restructuring in their own way.

ISG, formed in 1984, had a pretax loss of \$69.7 million last year on revenue of \$1.19 billion, and a loss of \$109.3 million in 1985 on revenue of \$1.11 billion. In the past, McDonnell Douglas management has ascribed much of ISG's losses to the cost of amortizing ISG acquisitions, such as Tymshare, Inc. and Microdata Corp.

The ISG's divisions focus mainly on software and services, with the exception of the Computer Systems unit, which sells Pick Systems' Pick-based systems formerly made by Microdata.



# NonStop CLX.™

Low-cost, distributed processing for every business location.

## ONE SYSTEM, FOUR SIZES.

The newest member of the Tandem NonStop family can run a fully distributed network. You can start with a single-processor system ideal for small applications. You can expand to two, four and six-processor systems, with over 10 gigabytes of memory, enough for hundreds of users at each node in your network.

## ADVANCED COMPONENTS, FEWER PARTS.

Our custom CMOS chip design delivers more performance on less power and requires less space.



So does everything else. Our single-processor system operates with only two boards. The processor board consolidates over 1,000 inte-

grated circuits in a six-chip set and comes with four megabytes of memory. A single integrated controller board supports disk, tape, communications and remote maintenance.

## EASY MAINTENANCE, REMOTE DIAGNOSTICS.

Special software does all the work, so you can maintain it yourself, let us do it, or we can do it



cooperatively. All critical components can be replaced without tools by any office worker. They

can be easily replaced without interrupting the

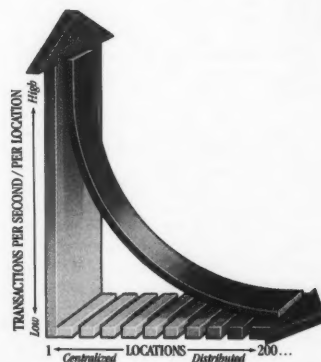
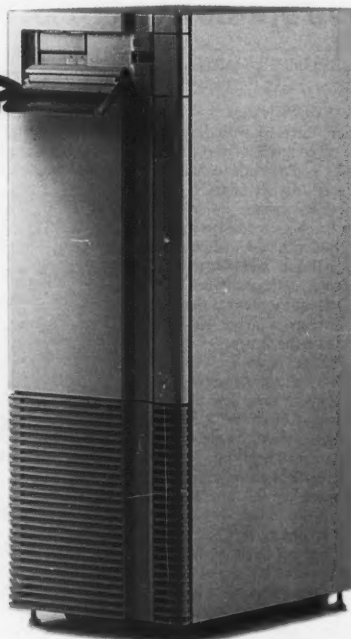
application. That means fewer service calls that take less time. Other software allows remote diagnostics from Tandem service centers.

## ONE SOFTWARE FITS ALL.

Tandem's unique, parallel architecture turns all systems into one system. This top-to-bottom compatibility means you can change the size of the system without changing the application software.

## INTRODUCING NonStop SQL™ DATABASE TECHNOLOGY.

Tandem has now combined SQL productivity and high-performance OLTP in the same relational database management system. Users can read, write and update data anywhere in the Tandem network with total data



*High performance at any level. Only Tandem is equally productive whether you're processing transactions in high volume from a central site or many distributed sites.*

integrity. They also have local database autonomy so that local processing continues when other parts of the database in the network are unavailable.

## EXTEND YOUR TANDEM NETWORK. OR START ONE.

Now it's easily affordable. Whenever there's a need for constantly current information, efficient expandability and unbeatable price performance, Tandem technology proves consistently superior. Compare us to any other OLTP system. You'll see why companies in every major industry choose Tandem.

For information, write:  
Tandem Computers Incorporated,  
19191 Vallico Parkway, Loc. 4-31,  
Cupertino, CA 95014. Or call  
800-482-6336.

**TANDEM COMPUTERS**  
*The technology leader in on-line transaction processing.*



## IBM creates French VAN venture

BY AMIEL KORNEI  
IDG NEWS SERVICE

PARIS — IBM recently became the first company to benefit from the recent moves by the French to deregulate the country's telecommunications services market with the creation of a joint value-added network (VAN) services venture with French software and services group Sema-Metra and two major financial institutions.

The move was expected. In June, IBM announced plans to go ahead with the venture after completing a feasibility study that it had started in February 1986.

The new firm, which is called Axone and is 45% owned by IBM, is being created following the publication last month of a series of decrees permitting private operators to resell value-added traffic generated over private lines leased from the state-run postal and telecommunications monopoly.

### Three-year effort

IBM has been nipping at the heels of Europe's slow-going deregulatory efforts for the past three years.

Recently, IBM has argued that liberalized telecommunications equipment and services markets would stimulate European information technology businesses as well as increase competition within the European industry.

IBM has already announced VAN services ventures in Italy, Spain and Denmark.

### Diversified services

As recently as Sept. 3, the company revealed that it had entered into a joint study agreement with Sweden's L. M. Ericsson, one of Europe's leading telecommunications vendors, that will focus on intelligent networking over leased lines.

According to an IBM spokeswoman in France, Axone will eventually offer services aimed at the insurance and automobile industries.

But initially, the new firm reportedly will sell backup teleprocessing services previously offered by IBM in France through the company's International Network Services unit.

One issue raised by the IBM venture is France's Postal Telephone and Telegraph authority's (PTT) demand that within two

years, all service providers must conform to the Open Systems Interconnect (OSI) standards framework. IBM and PTT officials reportedly privately scoffed at the notion that this is a surprise or a problem for IBM.

### The OSI gospel

The PTT, as well as most European communications vendors, have preached the OSI gospel for some time.

In addition, although IBM's predilection for its proprietary Systems Network Architecture (SNA) protocol is no secret, the company has repeatedly expressed its support for OSI and developed products to back up those claims of support.

The Axone network, which is immediately operational, is based on SNA, with the intention of offering access to OSI protocols "as they are available," according to the IBM spokeswoman.

The new firm reportedly will be 30% owned by the investment and banking group Paribas and its affiliate Credit du Nord. It will be 20% owned by nationalized banking group Credit Agricole and 5% owned by Sema-Metra.

## Ford agrees to acquisition of U.S. Leasing for \$512M

BY KATHY CHIN LEONG  
CW STAFF

SAN FRANCISCO — After long discussions all this summer concerning a buy-out, Ford Motor Co. has agreed to acquire U.S. Leasing International, Inc. for more than \$500 million.

According to a U.S. Leasing spokesman, the acquisition is slated for completion by the middle of next month.

U.S. Leasing, based here, writes leases for a wide variety of equipment, including small business computers, electronic test devices and railroad and aircraft gear.

### Two computer divisions

Two of U.S. Leasing's seven subsidiaries, which are also located here, handle the computer business.

U.S. Leasing Corp. handles the leasing of microcomputers, and U.S. Portfolio Leasing offers rental arrangements on similar equipment.

When the deal goes through, Ford will inherit approximately 1,700 employees, most of whom

are based in the San Francisco area. Ford will obtain U.S. Leasing's assets, estimated at \$1.65 billion.

U.S. Leasing directors have already approved the acquisition, which is based on Ford's \$68-a-share tender offer and is estimated at \$512.5 million.

"We've been a profitable public company for many years," U.S. Leasing spokesman Ernie Haycox said.

"But now, the Ford parent will give us an opportunity to develop new services and products," Haycox added.

### Products not named

Haycox would not specify the type of products that are expected to come from the new company.

However, he did stress that employees are generally pleased with the buy-out.

Under the terms of the new arrangement, the current U.S. Leasing management structure will stay intact, as will the company name.

Headquarters will remain here.

## KNOW THE SCORE

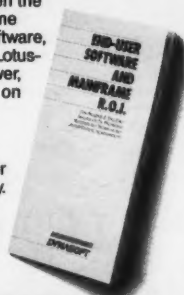
### THE MAINFRAME SPREADSHEET GAME

IBM	0
LOTUS	0
DYNAPLAN	75,000

Since 1982, DYNAPLAN has been the most valuable player in The Mainframe Spreadsheet Game. As mainframe software, DYNAPLAN provides full PC-like (and Lotus-like) functionality with additional power, capacity and efficiency not possible on any PC or LAN.

Plus, DYNAPLAN seamlessly integrates with DYNASOFT word processing and graphics systems for unprecedented end-user productivity.

To learn how to maximize your overall computing investment through mainframe-based end-user software, call for this free booklet today.



1-800-332-3962  
Illinois 312-696-4440

**DYNASOFT**

IF ONLY THERE  
WAS A COMPUTER  
SHOW...

## EXECUTIVE CORNER

C. B. "Jack" Rogers Jr., formerly a senior vice-president with IBM, has been elected president and chief operating officer of **Equifax, Inc.** Rogers has been a member of Equifax's board of directors since 1978.

Rogers helped organize IBM's General Systems Division in 1969 and was president of the division until 1979. He became a senior vice-president in 1982 and was a member of IBM's

Management Committee and Corporate Management Board.

**Arete Systems Corp.** recently announced the appointment of **Gene Manno** to the newly created position of chairman and chief executive officer.

Manno comes to Arete from Honeywell Bull, Inc., where he served as executive vice-president and was responsible for the Departmental Systems and Of-

fice Marketing Systems divisions with special emphasis on major customer projects and new business development.

Prior to the formation of Honeywell Bull, Manno headed Honeywell Information Systems' small computer and office systems operations as group vice-president.

**National Semiconductor Corp.** announced the appointment of **Richard C. Eppe** to the position of vice-president for product operations in National

Semiconductor's Information Systems Group.

Eppe has overall responsibility for coordinating development and manufacturing efforts of product operations groups within National Advanced Systems Corp. and Datachecker Systems, Inc. Prior to joining National Semiconductor, Eppe was president of Parallel Computers, Inc. in Santa Cruz, Calif.

**NCR Corp.** announced the appointments of **Richard B. Reese**, as vice-president of its corporate Customer Services Division, and **Gary W. Burnett**, as vice-president of its U.S. Data Processing Group Customer Services Division.

**Tandem Computers, Inc.** announced that it has appointed **Robert G. Gargus** as corporate controller and **Gerd Stoecker** as treasurer. Both will report to Tandem Vice-President and Chief Financial Officer **David J. Rynne**.

**Wayne N. Harvey**, formerly vice-president of development at Oracle Corp., has joined **Orion Network Systems, Inc.** as vice-president of software development.

Harvey will be responsible for expanding Orion's connectivity

software products that implement both IBM Systems Network Architecture and ISO standards.

**Neti Technologies, Inc.** announced the appointment of **Gary R. Balleisen**, the creator of Supercalc, as technical advisor.

Balleisen was involved with the design and development of Ashton-Tate's Dbase III and Dbase III Plus. In 1981, he wrote the original version of Supercalc. Most recently, Balleisen produced Migent Software, Inc.'s Ability Plus, an integrated software product that competes with Lotus Development Corp.'s Symphony and Ashton-Tate's Framework.

Balleisen is president of his own firm, Profound Software, Inc. in Pacific Grove, Calif., which provides microcomputer software development and documentation services to software publishing firms.

**Multiflow Computer, Inc.** announced that **Jan R. Brundin** has been appointed to the new position of vice-president of product management. Brundin joins Multiflow Computer from Unisys Corp., where he was vice-president of product strategy and development.

## Counterpoint to buy Taiwanese firm

BY JULIE PITTA  
CW STAFF

SAN JOSE, Calif. — Counterpoint Computers, Inc. officials said last week that Counterpoint is negotiating a strategic alliance with Taiwanese company MSC Group but declined to offer further details amid reports that Counterpoint will be acquired by MSC.

MSC is one of Counterpoint's largest OEM customers. Sources said that an alliance between the two companies should be formally announced within the next few weeks.

A manufacturer of Unix-based multiuser systems, Counterpoint has supplied MSC with its System 19K computer since late last year under a three-year, \$20 million OEM agreement between the two companies.

The Counterpoint computer has been the cornerstone of a multiuser system sold by MSC members Multitech Industrial Corp. and Sertek International, Inc. in the Far East and Europe.

Other terms of the OEM agreement call for Counterpoint and MSC to jointly develop and market future products.

A Taiwanese conglomerate,

MSC boasted sales of about \$200 million last year.

Privately held Counterpoint, founded in 1984 by former Convergent Technologies, Inc. executive Pauline Alker and a Convergent colleague, has sought alliances with a number of other computer companies in order to obtain financing. Among its most prominent investors are AT&T and Kyocera Corp.

Counterpoint President and Chief Executive Officer Alker was in Taiwan last week and could not be reached for comment on the future relationship with MSC.



## The latest facts on VAX are coming to New York October 26-28

If you need to know how recent DEC product announcements will impact your data processing operation, attend the VAX Business User Forum, the first VAX-specific conference for the VAX user.

This event offers one day of professional tutorials with full-day instruction in multi-vendor and VAX computing topics. And two days of conferences that will cover a variety of topics crucial to VAX-using professionals.

**Choose from over** 30 strategically planned conference sessions. A few topics to be addressed are:

• Linking IBM PCs to VAX and MicroVAX • Capacity Management of Digital Systems • Managing Multi-Vendor Networks • Digital's Connectivity and Network Management Strategies • Solving the Office Problems • Data Base in VAX Environments • Productivity and Applications Software

**Hear the latest** from leading industry experts:

• **George Colony**, Forrester Research • **Dr. Ira Cotton**, Booz, Allen and Hamilton • **Ann Dooley**, Computerworld FOCUS • **Francis X. Dzubeck**, Communications Networks Architects • **Jerry Eisen**, Office Sciences International • **John Gantz**, Tech Street Journal • **Frank Gens**, International Data Corp. • **John Holland**, DMW Group • **Jeff Horn**, Network Strategies • **Pat Kenealy**, Digital NEWS • **Michael Millikin**, Seybold's Office Computing Group • **A. Sonny Monosson**, American Computer Group • **Bob Randolph**, International Data Corp. • **Marc H. Rudov**, Telematics Resource Group • And others.

**Take advantage of** this opportunity to learn the latest on VAX! Call Dorothy Ferriter today at **800-343-6474** or 617-879-0700 X327 for more information.

**VAX**  
BUSINESS USER  
FORUM

The VAX Business User Forum is sponsored by Digital NEWS, the newspaper for VAX computing. And is produced by IDG Conference Management Group, best known for Communication Networks. Both are International Data Group companies.

VAX is a trademark of Digital Equipment Corporation.

## Micropolis

FROM PAGE 105

feet on the 3½-in. hard-disk technology. While most disk drive companies are beginning to establish a foothold in that growing market, Micropolis has remained silent.

Micropolis will announce next year a 3½-in. hard disk product, according to President Stuart P. Mabon. But he would not elaborate. In addition, the optical disk drive market is expected to gain favor among data processing managers and MIS directors for archiving and desktop publishing applications, among others. While other disk makers, such as Seagate Technology, Inc., have at least announced intentions, again Micropolis has been quiet.

"There are a lot of risks in optical," Baffa says. "There are no real standards established, and there really isn't a strong market there yet. We would rather run the risk of not being in a market than in being in a market with the wrong product." Baffa does not rule out optical disks as possible product offerings in the long term, however.

By all accounts, Micropolis is poised at the top of its industry. Estimates give the firm a 50% share of the 5¼-in. hard disk

market, a market that is expected to grow 50% a year for the rest of the decade.

### 'The hottest'

"Micropolis is the hottest company in the industry right now," says David P. Vellante, storage analyst for International Data Corp. in Framingham, Mass. "They are the industry leader in high-capacity 5¼-in. products, their stock is doing well, and they are making money."

What impresses analysts and observers most about Micropolis is the company's wide array of OEM customers for its hard disk drives. While some hard disk makers have become overly reliant on — and therefore vulnerable to — large contracts with computer makers, Micropolis's customer base is a veritable Who's Who of computing. It includes AT&T, Digital Equipment Corp., Apollo Computer, Inc., Sun Microsystems, Inc., Unisys Corp., Hewlett-Packard Co., Wang Laboratories, Inc. and Prime Computer, Inc.

Known mainly as a hard disk vendor for workstations, Micropolis is beginning to edge into the high-end microcomputer arena as well. Most notably, Micropolis is supplying Compaq Computer Corp.'s new 386/20 Model 300 system with a 380M-

byte hard disk drive.

The 380M-byte hard disk is seen as pivotal to Micropolis's future. Along with Compaq, Micropolis is also supplying AT&T with the high-capacity hard disk for that company's 3B2 mini-computers. Previously, Control Data Corp. had been supplying most of AT&T's hard disk needs.

Although its product line is conservative, Micropolis is not exactly sitting still. At Comdex/Fall '87 next month, the company reportedly will introduce a 760M-byte 5¼-in. drive as well as its first half-height hard disk, with 182M bytes. Half-height disks are becoming increasingly popular for microcomputers because of the small form factor.

Another potential competitive threat may come as Micropolis customers such as DEC and HP expand their own disk drive manufacturing capabilities, sparking concerns that there will be less need to buy drives from Micropolis.

"Most big computer companies at one time or another make their own disk drives, but they can't afford to make them all," Mabon says. "Our job is to supply them with drives they don't make and act as a standby for the ones they are planning to make but don't work out."

## IBM

FROM PAGE 105

IBM is selling a lot of 3090s.

But what about the future? Does IBM have any plans to wean itself from relying on that part of the computer business which, with 80% gross margins humming along, has rewarded the company with industry dominance?

### No shift in focus

Sure, there is the 9370, the Personal System/2, Silverlake, Systems Application Architecture (SAA), Solutionpacs and the much-heralded Micro Channel. But has the industry seen any real evidence that IBM's basic philosophy has shifted away from getting more (and larger) mainframes out the door?

Mainframes, of course, are not going to go away. There are now and will be thousands of MIS shops that will continue to buy or lease IBM mainframes in healthy quantities.

And there is plenty of innovation going on in those same shops in finding new and better ways to link and use the high-MIPS workhorses.

But the revolutionary (or evolutionary, as so many marketers are fond of saying)

changes in technology and the corporate philosophy of MIS have brought a whole new set of rules to the industry game.

"The Digital style of computing" may be a pompous, gimmicky phrase by which DEC sells its VAXs, but it does speak to the point of seeking alternatives to the mainframe.

DEC's market-share gain is a solid example, but so are the corporate success stories of Sun Microsystems, Tandem, Compaq, Oracle, 3Com, Novell, Apple and scores of others. A brief scanning of trade publication headlines says a lot; just last week, *Computerworld* reported that McDonnell Douglas will replace an IBM 3032 with a Tandem VLX to support its EDI-Net network.

With the 9370 and SAA, among other announcements, IBM would seem to be turning its ship in the right direction. But strategic new products and software directions are not enough. IBM must be ready to acknowledge that its users are moving away from mainframe myopia, and if it is truly committed to "The Year of the Customer," it had better do the same.

Wilder is *Computerworld's* senior editor, computer industry.

MANAGING YOUR VSAM ENVIRONMENT  
ISN'T ALWAYS EASY...



UNLESS YOU USE VSUM!



DECISION SUPPORT SOFTWARE FOR MVS USERS OF VSAM  
THAT ADDS A VSAM EXPERT TO YOUR TEAM

- INTELLIGENT CATALOG USE
- EFFICIENT DATASET DESIGN & MODELING
- ARCHIVAL & PRINTING OF SPACE UTILIZATION STATISTICS
- EFFECTIVE DATASET & CATALOG SPACE UTILIZATION
- USEFUL TUNING RECOMMENDATIONS

Challenge us!

**STAR**

Software Technologies  
and Research, Inc.

1-800-258-STAR

Telex: 99001527

FEATURES THE  
PRODUCTS I NEED  
AND...





## Firms gain

FROM PAGE 105

Because much of NCR's revenue gain is overseas, Labe said some of the revenue growth stems from a positive currency exchange to U.S. dollars.

• **AMD.** AMD recorded a loss of \$53.7 million, or 72 cents per share, on sales of \$260.9 million for the most recent quarter, ended Sept. 27.

The Sunnyvale, Calif.-based chip vendor said the results for the quarter include a one-time charge of \$41 million associated with the acquisition of Monolithic Memories.

The merger of AMD and Monolithic Memories was completed Aug. 13.

In last year's like quarter, the two companies had combined sales of \$229.1 million, with a loss of \$43 million, or 56 cents per share.

That period included an unusual charge of \$19.9 million, AMD spokesmen said.

• **Seagate Technology.** The Scotts Valley, Calif., vendor of rigid disk drives announced a 39% decrease in earnings for its first quarter, reporting \$14.8 million, or 30 cents per share, compared with income of \$24.5 million, or 50 cents per share,

for the like quarter last year.

Sales for the period were \$226.1 million, an increase of 20% over the \$189 million reported for the comparable quarter a year ago. The sales represent a decrease of 10% from the \$250 million reported for the preceding quarter ended June 30.

The earnings for the recent period reflect a 60% decrease from the \$37.2 million, or 74 cents per share, reported for the quarter ended June 30.

"Basically, the competition has heated up in the disk drive area as there was a production transition into higher capacity products and down to 3½-in. drives," explained analyst Gary Shields of L. F. Rothschild & Co.

Shields said Seagate's shipments were down just 1% in the third quarter, although the selling price per unit was down 8%.

For the current quarter, Shields forecasted \$245 million in sales and 38 cents per share in earnings.

Seagate "will not reach volume production of 3½-in. drives in the December quarter.

When they do reach volume production, either in the March or June 1988 quarter, the company's earnings will begin to be positively impacted," Shields noted.

**C**OMMUNICATIONS products manufacturer Network Equipment Technologies Corp. caught the wave and rode it to the shore with a 446% increase in its net income over the similar quarter last year.

However, he added, pricing pressures will continue to be severe.

• **NET.** A 91% increase in sales and a 446% increase in income was recorded for the period ended Sept. 27 by the Redwood City, Calif., developer of advanced communications products.

Sales for the period were \$20.5 million, compared with \$10.7 million in the like quarter last year.

Income was \$4.2 million, or 31 cents per share, compared with \$780,000, or 6 cents per share, in the comparable period last year.

The income reflects an extraordinary tax credit, which was a result of net operating loss carryforwards of \$1.5 million, or 11 cents per share, for the quarter.

• **Automatic Data Processing, Inc.** Profits for the Roseland, N.J., computing services firm rose 34% to \$30.4 million,

or 39 cents per share, compared with \$22.7 million, or 30 cents per share, in the similar quarter last year.

A lower effective tax rate had a positive effect on the earnings, according to the company.

Revenue for the period was \$361.3 million, up 13% from sales of \$321.1 million in last year's like quarter.

• **Digital Communications Associates, Inc. (DCA).** For its first quarter ended Sept. 30, DCA reported earnings of \$8.9 million, or 59 cents per share, up from \$4.1 million, or 28 cents per share, for the same quarter a year ago.

Sales totaled \$50.2 million, an increase of 27% over the previous year, when sales were \$39.6 million for the quarter.

The Alpharetta, Ga.-based company attributed the increases in part to a reduction in earnings of nearly \$4 million in the first quarter last year.

Also credited for the increase

were new personal computer communications products and the continued success of networking equipment operations.

• **Silicon Graphics Computer Systems.** The company reported a large increase in sales for the quarter as its reduced instruction set computing architecture proved to be successful, according to Edward R. McCracken, Silicon Graphics' president and chief executive officer.

For the first quarter ended Sept. 30, sales were \$28.9 million, an increase of 77% over the like period for the prior fiscal year, when sales of \$16.3 million were recorded.

Earnings climbed by 70% to \$2.95 million, or 22 cents per share, compared with the \$1.7 million, or 16 cents per share, reported in the similar quarter last year.

• **Intergraph Corp.** Huntsville, Ala.-based Intergraph recorded a 19% increase in income for its third quarter. Profits for the period were \$18.4 million, or 32 cents per share, compared with \$15.5 million, or 28 cents per share, for the like quarter last year.

Sales rose to \$157.1 million from \$150.9 million in the similar period in 1986.



## The latest word on mainframe word processing...

# EdWord

### EdWord is easier!

When our customers talk, we listen...And they say EdWord is easier to use. Here's why:

- What you see is what you get
- Flexible page preview
- Menu-driven commands
- PC-like convenience
- On-screen rulers for formatting ease

### Inherent connectivity

Mainframe word processing with EdWord gives you all the benefits of shared data with no LAN hassle:

- Automatic security and back-up of files
- Ability to share documents with other users and applications
- Ready availability of mainframe terminals & printers

### Spreadsheet integration

EdWord can be fully integrated with ESS (Electronic Spreadsheet), the popular mainframe spreadsheet from Trax.

### Call today for a free trial!

Available now for TSO, CMS, ROSCOE, and CICS, including the new 9370 departmental computer. Support for all 3270 terminals.

**Trax**  
Trax Software, Inc.

213-475-TRAX | TELEX: 350048

10801 National Boulevard | Los Angeles, CA 90064-4126



# THE WORLD CONGRESS ON COMPUTING!

## The Systems. The Solutions.

An exclusive event for information systems executives and professionals. Featuring the world's largest, most comprehensive exposition of systems hardware, software, services and accessories. And an expert conference of information, perspectives, alternatives and tactics. Packed with ideas to drive your systems to new levels of productivity and efficiency!

**For four days, the focus of the applications systems world will be in Chicago!**

MIS/DP executives who manage the world's information power will attend The WCC, from large corporations on every continent, in every industry. To learn. To buy. To chart their future directions. Can you afford not to be there?

For complete exhibitor or attendee information, complete and return the coupon today. Or, to reserve your company's exhibit position, call (617) 449-6600, Ext. 4013.



**WORLD CONGRESS ON COMPUTING**

March 28-31, 1988

McCormick Place • Chicago, Illinois, USA

Together with

**INTERFACE '88**

Produced by

☒ **THE INTERFACE GROUP, Inc.**

World's Leading Independent Producer of  
Conferences and Expositions

**TELL ME MORE about the unexcelled opportunities available at WCC!**

- ☐ Send me exhibitor information and contracts  
☐ Send me attendee information when available

Name \_\_\_\_\_

Title \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Phone (\_\_\_\_) \_\_\_\_\_

Return to: The World Congress on Computing  
300 First Avenue • Needham, MA 02194

# THE CASE OF THE RAGING CFO.

Anderson & Lumbard



What were behind his impossible demands?

**R**ecently, you may have read about "The analyst who knew too much" and the problems he caused his company.

We can still send you a copy of that case story if you missed it. (Just give us a call). But today, we'd like to share with you the story of another Fortune 500 company and the headaches that the CFO there caused for MIS executives.

It is a story well worth reading. It will help you answer questions your CFO will probably ask you. It could save your company money.

And, if you are like the MIS executive in this story, you may turn out to be a hero.

You will also learn about a new advanced financial software product called FASTAR, which was developed by Corporate Class Software, a subsidiary founded by the \$3 billion Celanese Corporation.

Here's what happened.

The new CFO of a \$2 billion-plus consumer products company had a reputation for toughness that the MIS director soon learned was well deserved.

Within weeks after taking command, the CFO made his demands known. He wanted five years of data available for each division and each product line—up from three years. He wanted faster reports and faster analysis from his staff. And he wanted MIS to arrange for all of this "as soon as possible."

There was only one problem. And the MIS executive knew it. What the CFO wanted was simply impossible to do well without a fourth generation language solution. And the MIS executive had enough experience to know what a fourth generation language solution would mean.

## TRouble, TRouble, TRouble.

There would be hours and hours of expensive programming and maintenance to support a 4GL solution. And financial analysts still would not be able to work readily with their PC-based spreadsheets.

To complicate matters further, different parts of the existing system kept the same financial data in different formats. The cost of maintaining redundant data that could not be easily shared by analysts was running higher and higher.

A team of MIS executives and financial support personnel soon came to a grim conclusion: Several months would be needed to meet the CFO's demands. And the maintenance problem would grow and grow.

What would you have done in their position? As one observer put it: "They knew they had a major problem on their hands."

## A DRAMATIC DISCOVERY.

The solution came from a company called Corporate Class Software.

"The executives at MIS didn't believe us at first," recalls one Corporate Class executive. "And I can't blame them. What we had produced didn't seem likely."

The company had developed a product called FASTAR—Financial Application

Solution to Analysis and Reporting—that was the first packaged solution to advanced financial applications.

No fourth generation languages were needed to perform financial applications. No macros were necessary. And all data could be loaded onto Lotus 1-2-3 spreadsheets for work there. (Yes, we'd be skeptical too. You'll find out how all this was done in a minute.)

When the decision was made to test FASTAR, the entire system was set up within a week and loaded with a division's worth of data. Now, when an analyst compared the cost of a product over five years, it took only minutes, instead of an entire day.

What's more, the CFO now had the flexibility to assign new divisions and product lines to his analysts without taking the time to reprogram the system. FASTAR was built to expand horizontally (for companies) and vertically (for products).

How could all this be done?

## THE PRODUCT THAT ALMOST DEFIES DESCRIPTION.

FASTAR acts as a bridge between PCs and mainframe financial production systems, such as the general ledger.

But it is more than a bridge. It is a ready-made solution for advanced financial applications that organizes data the same way that analysts are used to working with it—by financial schedule (income statements, etc.), by organization entity (divisions, etc.), by period (day, week, month, etc.) and by type (any fourth type of data you choose such as actual, budget or forecast).

	INTERNALLY DEVELOPED	PACKAGED SOLUTION
BASIC APPLICATIONS	COBOL	MISA MCCORMACK & DODGE SOFTWARE INTERNATIONAL
ADVANCED APPLICATIONS	4 GLS SPREADSHEET LOTUS MACROS	FASTAR

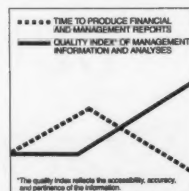
FASTAR is not a tool, but a ready-made solution for advanced financial applications, including financial consolidation and management reporting.

With the proper clearances, analysts can access financial information from any financial schedule for any company in the corporate structure. And they can consolidate and analyze that information without ad hoc programming. (Our powerful analysis package is built in, so there's no fourth generation language or macros programming needed. Even analysts who are computer illiterate can derive the same benefits from FASTAR as anyone else.)

As a result, analysts report more quickly, consolidate more accurately, and analyze more frequently.

One company found, for example, that year-end reports that used to be available in early April, just prior to the annual meeting with shareholders, were now ready in February. And consolida-

tions that used to take two to three days now took hours—with more accurate content. (One way that we've made con-



FASTAR is the packaged solution to advanced financial applications that can provide quantitative and qualitative improvements in your company's financial analyses.

solidations more accurate is through a rigorous system of data checks that automatically check data integrity.)

## BRING THE NUMBERS BACK WHERE THEY BELONG.

FASTAR also addresses the critical issue of data integrity and control.

Because FASTAR takes all programming off the spreadsheet, there are no undocumented programs to cause costly mistakes. (One analyst in another company had written a 1,000 line macros program before management pulled the plug. He was the analyst who knew too much.)

FASTAR also eliminates the need for passing data back and forth on pieces of paper and having secretaries or analysts type them into spreadsheets. This reduces the number of potentially dangerous errors that can occur.

And, perhaps most importantly, because all financial information is stored in FASTAR's data base, MIS executives regain control of critical data.

You also protect your company's investment. FASTAR accepts data from fourth generation language products and database management systems, as well as microcomputer applications. (None of the companies using FASTAR needed more than three days to adapt the program to their corporate needs.)

In the final analysis, MIS executives show themselves to be strategic thinkers by giving analysts a tool to be more productive. (Did you know that one company found 85 percent of an analyst's time is spent just looking for data?)

## LET'S TALK

You can see why financial professionals are interested in FASTAR. And why the chief financial officer of a \$3 billion company would put his reputation on the line to become chairman of our board of directors.

If you'd like more information about FASTAR call 212-719-8209.

**CORPORATE CLASS SOFTWARE, INC.**

1211 Avenue of the Americas, 23rd floor  
New York, NY 10036 (212) 719-8209  
A subsidiary of Hoechst Celanese Corporation.

FASTAR is a trademark of Corporate Class Software, Inc. Lotus 1-2-3 is a registered trademark of Lotus Development Corp.

SPOTLIGHT

# CAPACITY/PERFORMANCE MANAGEMENT SOFTWARE



**Managing the performance** and capacity of system resources requires looking at the present with an eye for probabilities and seeing beyond effects to controllable causes. These skills seldom come bundled in a single individual and, in some instances, extra help is needed in the form of expert systems.

# CICS USERS: DON'T TAKE OUR WORD FOR IT!

Read What Datapro Said  
About The Monitor for CICS

EASE OF USE  
AND WIDE APPEAL  
WERE BIG ADVANTAGES

The ability to see trends and take corrective action before problems occur is one of the prime reasons for having a monitor in the first place, and these users confirmed the fact that The MONITOR does this very well. The testimonials from these users were full of praise for The MONITOR. One user said, "The MONITOR is very well written and easy to use. I cannot imagine running a CICS shop without it." Another replied, "The package is excellent; not only from the monitoring standpoint, but when problems do arise, Landmark excels in product support."

BENEFITS TO USERS  
SPURRED THE MONITOR'S  
RAPID GROWTH

OVERALL USER SATISFACTION  
WAS 8.90 OUT OF 10

To learn more about The Monitor, or for  
your personal copy of The Datapro Report, send  
in the coupon or call toll-free 800-227-8911  
(in Virginia 703-922-7101)

THE  
**MONITOR**  
FOR CICS

Now Serving Over 1500 Sites Worldwide!

#### International Agents

Germany—Emerald Software Int'l GMBH  
Benelux—Emerald Software Int'l BV  
Southeast Asia—Infotech Consultants  
Japan—K.K. Ashisuto  
Australia/New Zealand—Optimum Software  
France—Technologies Systems S.A.  
United Kingdom—Systems Resources Ltd.

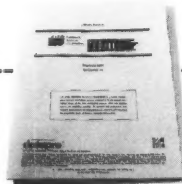
Scandinavia—WSA Scandinavia  
Italy—Software Technology  
Switzerland/Austria—Performance Software  
Brazil—William Joyce Associados Ltda.  
Israel—SITAV Software Ltd.  
Venezuela—ENIAC, C.A.

the product's design is directly geared to use by the entire data processing community: the application programmer, the systems programmer, operations personnel, and managers. While other monitors are shrouded in complexities and analyst-oriented output so that only specialized personnel can decipher the summary information, The MONITOR is specifically designed to make the information simplistic and graphically clear so that anyone can understand what is happening in the CICS environment.

TESTIMONIALS FROM USERS  
WERE FULL OF  
PRAISE

Almost every aspect of the product was mentioned. There were some who lauded the Activity Display component—"The best I've ever seen," was what one user said. Another user said the Collection Analysis feature was perfect for problem research.

The ability to perform capacity planning, and the use of PF keys to drive the system, were other benefits noted by these respondents. Low cost, ease of use, and low resource utilization were candidates for high honors on the lists of many of these users.



Landmark Systems Corporation  
6551 Loisdale Court  
Springfield, VA 22150

- ☐ Please send information ☐ Please send free, 30-day trial  
☐ Please send The Datapro Report on The Monitor for CICS

Name \_\_\_\_\_

Title \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ St \_\_\_\_\_ Zip \_\_\_\_\_

Phone (\_\_\_\_\_) \_\_\_\_\_

☐ VSE ☐ VS1 ☐ MVS ☐ MVS/XA

S7W64



## INSIDE

### Orphan Environments

When it comes to performance measurement tools, not all environments are equally endowed. Page S3.

### Interview

Pat Artis of the Computer Measurement Group discusses fables surrounding performance and capacity management. Page S9.

### A Fuller Look

Modeling helps analysts develop a clearer picture of their performance and capacity requirements.

### Vendor Viewpoint

In reaching for a quick fix, organizations often miss critical differences between performance measurement and capacity planning. Page S11.

### Controlling Usage

Job accounting and chargeback maintain control on the demand side. Page S14.

### Building Codes

Software performance engineering involves designing to performance specs and resource realities. Page S15.

### Product Charts

A detailed listing of performance monitoring tools. Page S16.

A selection of modeling packages. Page S12.

#### SENIOR EDITOR

Joanne Kelleher

#### ASSOCIATE EDITOR

Deborah Fickling

#### DESIGN EDITOR

Marjorie Magowan

#### RESEARCHER

Sally Cusack

#### ASSISTANT RESEARCHER

Bonnie MacKeil

#### INTERN

Jeff Goodwin

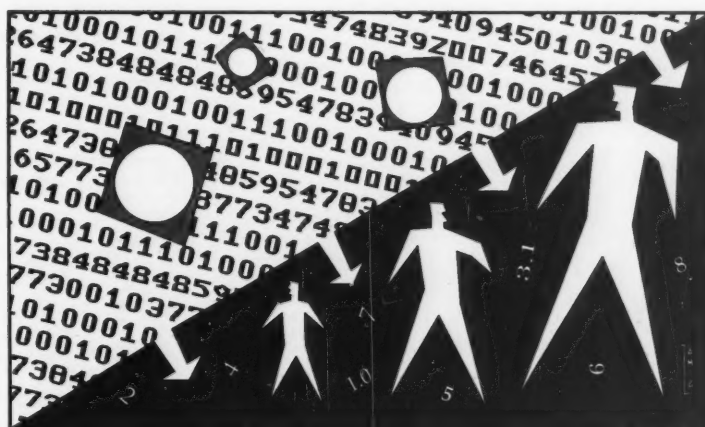
Cover illustration:  
Margaret Kasahara  
Cheatham

Copyright 1987 by CW Publishing/Inc. All rights reserved. Reproduction of material appearing in Computerworld Spotlight is forbidden without written permission. Send all requests to Nancy Shannon, CW Publishing/Inc., Box 9171, 375 Cochituate Road, Framingham, MA 01701-9171.

To control and plan systems in a businesslike way, firms integrate functions and rely on engineered knowledge.

# CLONING SKILLS FOR PLANNING

BY CAROL WEISZMANN



RENEE ZAMIC

**T**oo often, awareness of capacity management issues comes only with crisis. Certainly, response times and throughput and utilization rates are important, but the person who pores over stacks of printouts covered with incomprehensible numbers may seem more like an auditor than a programmer or an engineer. Capacity management is sometimes seen as a career cul-de-sac, its practitioners as geeks in a technical quagmire. And yet, capacity management is fast becoming mission-critical.

What happens to a bank's business if its computer systems cannot handle the volume of transactions at its automated teller machines? Or to the manufacturer whose inventory control system balks at just-in-time demands?

These days, when MIS's information processing needs are left unanticipated or system planning is poorly done, the damage to the organization's bottom line can be massive. As information systems start to play a critical role in daily operations, the days of MIS as a separate and independent enterprise are diminishing.

The need to ensure smooth systems operations is no longer restricted to the high end of IBM's mainframe preserve. Users are demanding better hardware and software integration from many different vendors. Today's systems are no longer isolated — either from each other or from the enterprises they serve. The price of capacity management mistakes is paid not by MIS but by an organization's operational functions and in corporate terms — lost revenue, lost customers, lost productivity, lost savings.

If today's information systems — be they data center mainframes, mid-range systems serving

departmental operations or networks of personal computers — are to operate successfully, they must enlist the help of capacity managers and capacity management software.

Hundreds of software products are already available under the capacity management umbrella. These products perform a broad range of tasks, including controlling data center operations, system administration, data interpretation, problem management, performance analysis and tuning, system sizing and capacity planning.

The Oak Brook, Ill., headquarters of Waste Management, Inc., a waste collection and disposal services firm, like many installations, employs several packages to stabilize and improve service to an on-line user community that has more than doubled at the site since 1986. Among the capacity management products in use at Waste Management's data center, which operates an IBM 3090 under MVS/XA, are direct-access storage device (DASD) management software from Uccel Corp., The Monitor from Landmark Systems Corp. and Stabilize/CICS from On-Line Software International, Inc.

Persistent storage violations under CICS that resulted in increasing numbers of system crashes led Waste Management to use Stabilize/CICS. The company's CICS processing volume, currently totaling about 200,000 transactions per day, is expected to increase to 500,000 per day

Weiszmann is an independent consultant and writer based in Natick, Mass. She specializes in software markets, artificial intelligence, vertical-market strategies and systems integration issues.

## Cloning

FROM PREVIOUS PAGE

by the end of 1988.

"We use Stabilize/CICS on two systems," the firm's senior technical analyst Rudy Pitte says. "On the test system, the transactions being tested will many times go into an uncontrollable loop, but Stabilize/CICS will usually catch the situation and terminate the transaction."

### Two in one

The broad term "capacity management" encompasses two major subcategories — performance management and capacity planning.

Performance management measures the daily level of performance an existing system, data center or network delivers. Performance monitoring software, which measures, records and reports on the key system or network elements, provides the data to determine if service levels are adequate.

The function of performance management is to allocate power — usually stated in terms of million instructions per second (MIPS), I/O rates and so on — to the work load, which usually means setting operating system parameters or DASD management. Performance analysts also monitor systems for response time, utilization levels and work load volumes to establish historical trends and provide data for capacity planners.

Capacity planning determines the requirements for future systems or networks — or upgrades and enhancements of existing systems or networks — based on modeling software that simulates system or network requirements. It requires several kinds of input, including peak-time work load and response- and service-time projections, as well as projections for existing and alternative equipment and configurations. In addition, service-level agreements must be established.

Capacity management is not only diverse but subject to flux as software bends and stretches to accommodate changes in the system. Software is moving in a number of new directions:

- Integration of previously separate functions in single-vendor products.
- Automation of previously manual operational tasks and functions.
- Development of products aimed at new areas, such as mid-range computers, networks and application software development.
- Migration of products to micros.
- Embedding of expert system techniques.

This last development will serve, to some extent, to drive all the others, because the challenge of capacity management is not only to sustain the efficient operation of computer installations but to make sure the capacity management effort itself is efficient.

### Capacity conundrums

The tools that exist today are less than ideal. First, their output is in numbers — lots of numbers — and the population with the expertise to interpret those numbers is dwindling. From the basic in-

put of a capacity plan — configuration and work load data — performance prediction models then compute such factors as response time, throughput and utilizations.

To use these models effectively, an analyst must thoroughly understand, in addition to the particulars of the hardware and the operating system, performance analysis concepts. Although guidelines for such use have been published, they are often too general in specific situations.

In the 1960s, systems programmers dealing with the early models of IBM's 370 architecture spent time debugging the operating systems; as a result, they understood much about the systems' internal workings. Some 20 years later, with virtually no operating system bugs left, systems programmers have comparatively little understanding of system innards.

"The average systems programmer isn't as smart today about the insides of systems as even five years ago," says Kevin Golden, Reston, Va.-based VM Software, Inc.'s product manager for VM Center II, VM Account and VM Monitor.

The second drawback to the current generation of capacity management tools

is that, while the software tends to require technical expertise, businesses now push technicians to display a higher degree of interpretive ability and industry understanding than they possess. Users of such tools must be able to relate the numbers to increasingly complex end-user requirements and business goals.

ness goals.

"We used to be very successful in plotting where we were going based on historical data," says Alan Sherkow, lead capacity and performance planner at First Wisconsin National Bank in Milwaukee. "But deregulation has brought so many changes that we can't use historical data anymore to figure out the future."

"Now we have to understand the business and its goals," he continues. "We have to communicate with our senior executives in their language, and we have to have credibility in the organization based on past success."

Computer Associates International, Inc.'s Ruth Heidel, development manager for the Garden City, N.Y.-based firm's ISS-3 capacity planning product, agrees. "The computer is an integral part of the business," she explains. "When capacity planners think about their strategies' least cost, or whatever it might be, these are business questions, questions that a technical person might not think of."

Reconciling the increased work load of managing system performance and planning future installations with the diminishing supply of seasoned personnel is a major problem, one that vendors are attempting to address in a number of ways.

### One source, one solution

One solution that a number of the leading independent suppliers of capacity management software arrived at is to market a single, comprehensive line of data center management tools.

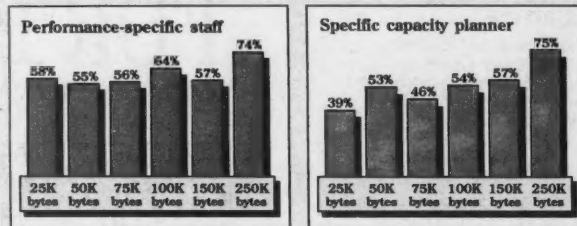
Their idea is to provide a single-vendor solution for all data center management problems. The scope of data center management is wider than just capacity management and includes software for job ac-

## System performance at CICS sites

Allocation of personnel and prioritization of problems among 4,000 CICS installations surveyed by Boole & Babbage, Inc.

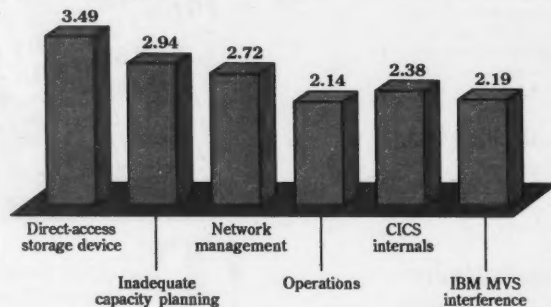
### Utilization of system performance specialists

Percentage of sites with performance staff and capacity planning specialists by daily transaction load



### Major performance problems

Degree of significance to users on a scale of 0 to 5, with 0 indicating no significance and 5 indicating high significance



INFORMATION PROVIDED BY BOOLE & BABPAGE, INC.  
CW CHART

counting and scheduling, network and storage management and security.

Sometimes this integrated software replaces programs written by in-house data center staff, which, according to VM Software's Golden, is a high priority for top management. Managers want to avoid homegrown software, he claims, because it requires maintenance, diverts programming effort from critical applications and often lacks documentation.

Currently, only a few independent software suppliers offer a truly full line of data center management software. Among the few are Computer Associates International, which has now swallowed former rival Uccel, and VM Software.

However, several independents concentrate on capacity management. These include BGS Systems, Inc. in Waltham, Mass.; Sunnyvale, Calif.-based Boole & Babbage, Inc.; Candle Corp. in Los Angeles; and Morino Associates, Inc. in Vienna, Va. Others, meanwhile, focus on highly specialized niches they see as not properly filled by the major suppliers, such as monitoring for a single product type. These firms include Santa Clara, Calif.-based Cambridge Systems Group, Duquesne Systems, Inc. in Pittsburgh and Landmark Systems.

Because the providers of full-line data center management tools have as their goal to boost both revenue and their customer base, the more specialized vendors are being pressured to integrate their product lines.

Software that automates the data center operator console has been available for a number of years. Only recently has interest in it been piqued by faster machine speeds, operational demands of networks and the emergence of an integrated hardware product line, not to mention IBM's Systems Application Architecture, on which the company's Netview offering is based. Much of this interest stems from MIS's need to help its personnel keep up with the operational demands resulting from faster machines and improved systems.

### Speed reading

A data center operator's job involves swift but repetitive routine activities that must be handled with consistency. The typical operator — with less than two years' job experience — must be able to comprehend messages that flash on the data center console at a rate of as many as 10 per second.

As machine speeds continue to increase — from five to six MIPS in the mid-1970s to 50 or 60 MIPS today and to an estimated several hundred MIPS by the early 1990s — the economies of scale the machines promise can be threatened by data center operators whose human abilities simply do not allow the CPU to run at peak efficiency.

The growth in mid-range systems, particularly with IBM's increased focus on medium-size machines, has enhanced

Continued on page 54

# For system changes, check the tool level

BY THOMAS BELL

The tools necessary for performance analysis may be available for your system — or you may need to develop your own. In the latter case, expect your costs to climb and your results to be late.

Tool development can be an interesting exercise: An expert can really demonstrate his skills by finding ways to extract data or predict bottlenecks. Unfortunately, such efforts can also consume skilled resources, diverting expertise from the task of improving performance.

Being blessed with an abundance of ready-made tools has everything to do with your environment. If you are working in IBM MVS, adequate tools are available for almost any commercial environment. In IBM VM, the list is shorter but still more than adequate.

A number of tools are available for Digital Equipment Corp. VMS, although they typically apply to a more limited set of application environments than the tools available for IBM's MVS.

Some Unix tools are available, but Unix developers do not concentrate on the performance of commercial applications. CPU time distribution can usually be determined, but the causes of I/O problems and communications delays are not usually revealed by available products.

Beyond these operating system environments, the alternatives are somewhat limited, for reasons of simple economics. Independent firms devote their development capital to the products that promise the largest payoffs. Therefore, users of other systems must frequently depend on those systems' vendors for performance analysis tools.

## Living with limitations

Even in the more sparse environments, some tools are available to support chargeback, set operating system parameters and identify hardware bottlenecks. This is because, historically, performance effort has been oriented toward data center performance management, including capacity planning.

Unfortunately, the data from these tools often does not report the expected system interaction, or it reports data incorrectly. Existing tools can usually be employed effectively, but only if you know how to design associated experiments and perform appropriate analysis after recognizing the tools' limitations and special

data definitions.

One of the most commonly used performance measures is CPU time, but in many systems it is not reliably provided by the vendor's operating system. Reports from any tool dependent on CPU time are unreliable to the extent that the underlying data is unreliable.

Much of the problem with inaccurate CPU time arises from allocating the time consumed by the operating system itself to applications. In addition, data base management systems and transaction monitors typically service a number of users simultaneously; their CPU consumption may need to be allocated to those users to support chargeback. Satisfying this objective may compromise other uses of the resource-consumption data.

Other measurements are afflicted by the same kinds of problems as CPU time. As a result of the need for data to satisfy other objectives, computer vendors and other suppliers often develop separate measurement tools.

You may find these tools useful, particularly for improving response times and application system performance. You need to make sure, however, that your definition of a metric is the same as the definition used by the tool's developer.

## Flagging resource hogs

DBMSs, communications software, transaction monitors and major application systems can greatly affect system performance. In most cases, a variety of departments use these products, and some of them may be abusers. The performance of some products clearly abuses the users who have to pay for those resources. Both situations need to be corrected for the technology to be applied effectively.

Systemwide performance measurement tools typically cannot provide the detailed information for addressing the performance of subsystems. Instead, special tools are usually needed to analyze or project their performance.

If you are considering selecting a new hardware or software product, now is the time to look at the adequacy of performance analysis tools. Perhaps the new product's performance can be judged with tools you already own. However, you may need to temper your consideration of its features by evaluating its ability to provide necessary information about its performance. •

# You Pay For Performance

When can monitoring computer performance be cost justified?

by M. Polan

Perhaps the most difficult type of decision for the management of an enterprise is the one that involves the use of computer resources. The immediate result of such decisions is the cost of the computer system. These costs are the sum of the hardware, software, and personnel costs. The hardware costs are the most visible, but the software and personnel costs are often the most significant. The hardware costs are the most visible, but the software and personnel costs are often the most significant.

With the growing trend of computerization, the cost of computer resources is becoming a major factor in the management of an enterprise. The cost of computer resources is becoming a major factor in the management of an enterprise. The cost of computer resources is becoming a major factor in the management of an enterprise. The cost of computer resources is becoming a major factor in the management of an enterprise.

In this article, we will discuss the cost of computer resources and how it can be reduced. We will discuss the cost of computer resources and how it can be reduced. We will discuss the cost of computer resources and how it can be reduced. We will discuss the cost of computer resources and how it can be reduced.

Costing the Cost of Computer Resources. The cost of computer resources is becoming a major factor in the management of an enterprise. The cost of computer resources is becoming a major factor in the management of an enterprise. The cost of computer resources is becoming a major factor in the management of an enterprise.

In addition to the cost of computer resources, the cost of computer resources is becoming a major factor in the management of an enterprise. The cost of computer resources is becoming a major factor in the management of an enterprise. The cost of computer resources is becoming a major factor in the management of an enterprise.

monitoring for CICS or accounting and management packages can be substantially more expensive. These expenses are usually not covered until the CPU system has been installed.

## Penalties on Value Rather than Cost

Another approach to getting the cost of the performance function is to look at the value of the service provided. The value of the service provided is the sum of the benefits derived from the service. The value of the service provided is the sum of the benefits derived from the service.

# Performance

What got your attention is a very sharp focus on performance.

Over 1,000 Data Centers currently see performance problems before they occur with Goal Systems' EXPLORE products. EXPLORE/VM™, EXPLORE/CICS™, and EXPLORE/VSE™ have earned a reputation for being well built, well supported, quality software.

The EXPLORE group of products offers:

- Realtime and batch reporting with each product
- User-defined thresholds, threshold-exceeded warnings, and realtime descriptive messages.
- Extensive online HELP facility, providing tuning suggestions
- Full color support, message highlighting, and graphics display
- Complete VM, CICS, and VSE monitoring from a single vendor

Used individually or in concert, the EXPLORE products can help you select ways to lower overhead, eliminate bottlenecks, and increase productivity. And, Goal Systems' 24-hour technical support is widely known as an industry benchmark for excellence!

The EXPLORE group of Data Center Management products is an outstanding aid for reducing DASD contention, poor response time, and delays the need for costly equipment upgrades. For more information, call 800-848-4640 today, and let us bring system performance into focus!

the cost of providing a high quality group of products is dependent on the quality of the system. In the supported business environment, the quality of the system is the most important factor in the selection of a system. The quality of the system is the most important factor in the selection of a system.

the cost of providing a high quality group of products is dependent on the quality of the system. In the supported business environment, the quality of the system is the most important factor in the selection of a system. The quality of the system is the most important factor in the selection of a system.

1. Applications will always tend to stay in use for longer than initially estimated.
2. Bad users will continue to request a new database structure in the functionality and capabilities of existing applications.



Goal Systems International • 5455 N. High Street • Columbus, Ohio 43214-1193 • 800-848-4640



## Cloning

CONTINUED FROM PAGE S2

the need for automated operations. "IBM's 9370 has triggered the present interest in automating operations," claims Alex Nedzel, managing associate at the Index Group, Inc., a Cambridge, Mass.-based information management consulting firm.

"Traditional minicomputer operating systems don't need much staff support, but MVS and VM do," Nedzel says. "So mid-range system installations have low support staff requirements. To compete in the mid-range, then, IBM can either develop low-support mid-range operating systems, or it can front-end its existing operating systems with automated operations consulting firm."

### Paradox of Netview

Then there is IBM's Netview. The single-presentation structure that makes Boole & Babbage's Auto Operator products ap-

**M**IS NEEDS to build software products to perform tuning because it does not want to use humans for the task.

pealing is at the heart of Netview and at the heart of Netmaster, a similar product from Cincom Systems, Inc.

Both of these products provide a uniform presentation of all network components, including non-Systems Network Architecture ones, at a host-based terminal. Consequently, network managers can control the operations of the physical network from the same place they oversee the operations of the logical network. Thus, the network manager is alerted when service levels are not met and does not have to flip through multiple products to track down the problem.

Netview, which many regard as being more architecture and intent than actual product, is greatly responsible for the growing interest in automated operations. But it is also a hindrance to them.

"Netview is getting everybody interested in automated operations," says Howard Perry, director of Boole & Babbage's capacity management product center. "But it's also keeping people from committing to any given product because people are disappointed in it."

Software that automates routine operations simplifies the interface between the operator and the system. Boole & Babbage's IMS and CICS Auto Operators, for instance, automatically react to system messages and include a browsable message journal, operating system status display and terminal support. These tools, as well as an MVS Auto Operator now in development, can be used in tandem and appear to the operator as a single product.

"With Auto Operator, you don't have to remember IMS command syntax, and you don't have to really know what you're looking for to be an effective IMS problem solver," notes Wendy Eaves, an IMS systems programmer at Dallas-based Dresser Industries, Inc. and an Auto Operator user.

One action that many of the major vendors — including Computer Associates, VM Software, BGS Systems and Boole &

Babbage — now or will soon take, is to offer capacity management systems in which knowledge-based expert system capabilities are embedded, a function particularly pertinent to automating operations. Expert systems are being used to resolve resource conflicts internally without operator intervention — so fast that response times of on-line transaction processing systems are not degraded.

### Forays into new territories

The same market dynamics that drive the interest in automated operations are generating interest in capacity management tools in new sectors, such as mid-range systems, networks and software development. In each of these sectors, the emphasis is on tools with knowledge about

performance analysis and capacity planning.

**Mid-range systems.** "Look at what IBM is trying to do with VM/XA — their goal is to make it tuning-less," VM Software's Golden suggests. "IBM is changing what an operating system is." As with other potential automated operations, MIS needs to build software products to perform tuning in certain kinds of machines and environments because it does not want to use humans for the task.

The demand for a machine that does not need to be tuned extends beyond the IBM world. The stated purpose of General Research Corp.'s expert system-based VAX tuning tool, TIMM/Tuner, is to help system managers of the Digital Equipment Corp. product perform tuning tasks

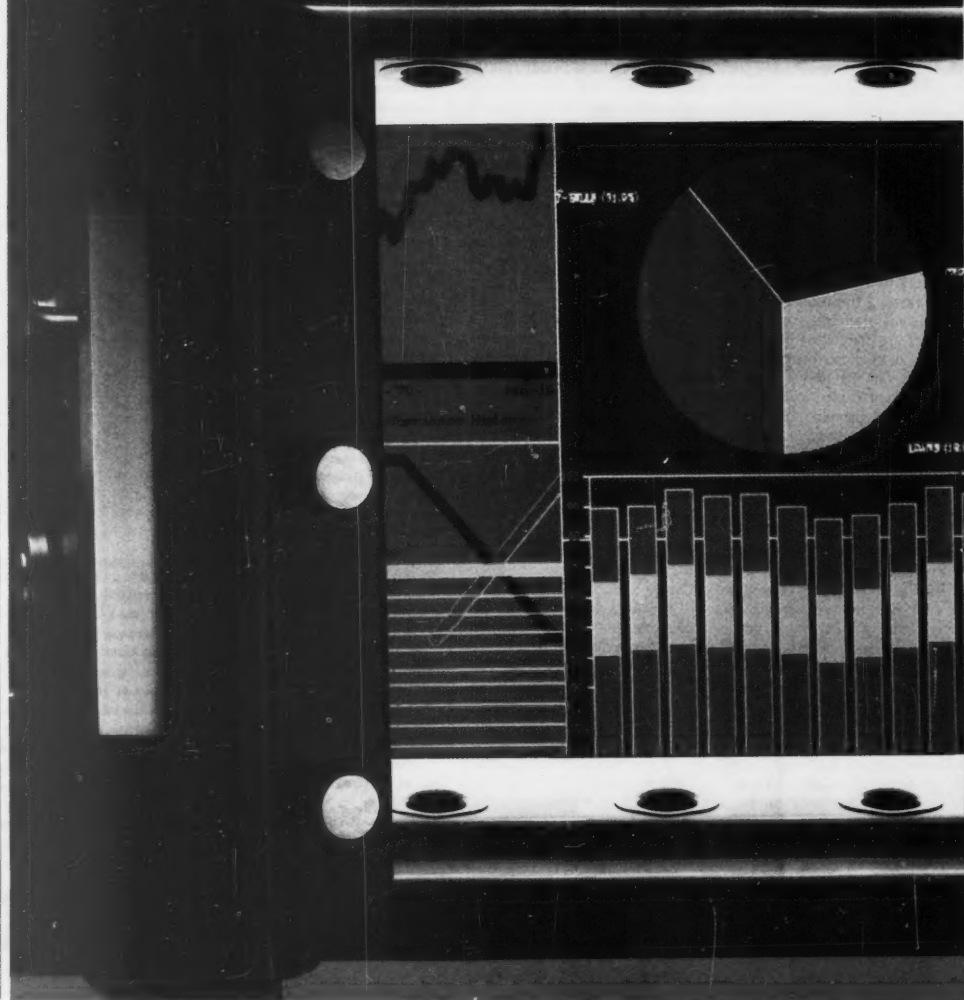
without outside help.

**Networking.** Since many networks have been constructed piecemeal throughout several years with equipment and software from a number of vendors, network managers struggle to maintain efficiency and responsiveness. In a world in which demand for networking is not abating, capacity planning is critical.

**Software development.** Testing new system applications or major enhancements to existing systems is so cumbersome and labor-intensive that capacity management software suppliers are providing products to streamline the process.

American Cyanamid Co.'s Shulton Division in Clifton, N.J., a provider of consumer products, used On-Line Software's

## AT&T Power Protection Systems: Your best security against costly downtime.





Verify, an automated CICS application testing tool, to ensure the quality of a new order processing and inventory control system called Clips.

When the time came to test Clips before it went into production, just one person was available to do the job, and three business groups with conflicting needs were suggesting software modifications.

"I did not want quality assurance to be a bottleneck for the development process," explains Bob Cottone, the division's manager of data center operations. So he successfully used Verify to do regression testing on the application; the software was used to document and research Clips' problems and bugs and to isolate, resolve and document program errors.

**I**T'S A WASTE of resources to seek precision in capacity plans with a horizon of more than six months. It's like measuring with a micrometer, marking the measurement with chalk and cutting with an ax."

ALEX NEDZEL  
INDEX GROUP, INC.

Some observers say they see little need for capacity management tools for software developers. "It used to be much more important for software developers to be aware of performance requirements than it is now," Index Group's Nedzel says. "But the resources that the software eats up are becoming so cheap as to

be inconsequential."

Others differ with that opinion. "You prepare an application completely differently for a mainframe than you do for a distributed mid-range configuration. Different application designs perform differently," James McGuire, BGS Systems' vice-president of products and marketing,

contends. "Specialized tools, based on expert system techniques, can tell developers how different application designs will perform."

#### PC-based management

Most capacity management software still operates on high-end hardware. However, some argue persuasively for running capacity management software on PCs. Accordingly, a few products incorporating expert system technology are beginning to emerge.

Computer Associates' ISS-3 boasts an embedded knowledge base. General Research's TIMM-Tuner, built using that company's TIMM expert systems tool, comes in a PC version. And Princeton, N.J.-based Applied Data Research, Inc. recently announced Mindover MVS, an expert system-based performance tuning and capacity management product that runs on IBM PCs.

"You make performance problems worse when you run capacity planning software on the mainframe because the software is so resource-intensive," says Henry Steinhauer, an associate with the compensation and benefits consulting firm Hewitt Associates and Midwest chairman of the Computer Measurement Group.

Steinhauer, an early user of Computer Associates' ISS-3, says he saves time on a PC because he is not dependent on an overloaded mainframe. "If you're running toward the top of the user resource-intensity curve," he notes, "you're burning a lot of cycles as you go through all the permutations of the environment. But with a PC you don't have to make matters worse to make them better."

Those whose modeling needs are highly detailed — for instance, firms modeling very large systems — will find PCs limiting. Boole & Babbage's Perry maintains. "PCs are better for less technical, senior-level decision making users," such as long-range strategic planners.

Index Group's Nedzel adds, "The best capacity planner is close to users and uses a highly interactive modeling tool, for which the PC is extremely well suited. Unless you have very specific knowledge about what your system will be doing in a couple of years," he adds, "it's a waste of resources to seek precision in capacity plans with a horizon of more than six months. It's like measuring with a micrometer, marking the measurement with chalk and cutting with an ax."

#### Role of expert systems

If capacity management's leading edge were to have a point man, it would be expert systems. It is important to realize that at this technology's heart is a software architecture or methodology that allows for a new kind of software functionality.

Generally, problem solving models are encoded in conventional software programs, but these models are implicit, and their knowledge is organized on only two levels: data and program. If knowledge is to be added to a conventional program, the entire program must be rewritten.

Expert systems, on the other hand, organize knowledge on three interacting levels: inference engine, knowledge base and data. The system's knowledge is developed and maintained separately from the rest of its programming.

The application of expert system architecture to specific, well-defined problems can result in software that, in the

### Eliminate the cause of up to 50% of your computer downtime: power disturbances.

Power disturbances, brief and imperceptible, cause very visible data loss, data errors, and equipment damage, all resulting in costly downtime.

According to AT&T Bell Laboratories and IBM research, a typical computer site experiences as many as 135 commercial power disturbances a year, accounting for up to 50% of all computer downtime.

#### The protection solution.

AT&T offers two product lines to combat these disturbances: the Uninterruptible Power System (UPS) and the Power Line Conditioner (PLC). Each effectively eliminates power fluctuations, including noise, transients, peaks, brownouts, and distortions. The difference being that the UPS includes a built-in battery reserve for protection against blackouts. The UPS is available in 1, 3, 5 and 10 KVA power ranges. The PLC is available in 3, 5 and 10 KVA models.

#### A 50-year advantage.

Why specify AT&T's power protection equipment over that of other manufacturers? Because AT&T has an unmatched 50 years of

experience in manufacturing power equipment. And, because AT&T also designs and manufactures computers, we have a unique understanding of what should go into a superior power protection product.

For instance, our parallel processing architecture offers reliability few others can provide. It also maximizes cost-efficiency: less power is needed to run our systems, and heat loss is substantially reduced.

#### Easy does it.

AT&T UPS and PLC power protection systems are easy to install, need no operator, and require no scheduled maintenance.

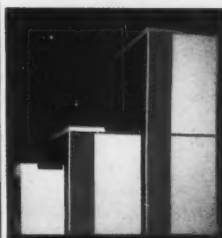
Furthermore, AT&T backs you with an unequalled nationwide service network and a 24-hour toll-free number for technical service support.

#### Fast delivery.

AT&T is ready to ship from stock. Once our Dallas facility has your order in-hand, we'll have your system speeding on its way to your site.

So for maximum security against power disturbances, along with low-cost, trouble-free performance, call AT&T at 1 800 372-2447 or mail the coupon below. Let us show you how to turn expensive downtime into productive uptime.

© 1987 AT&T

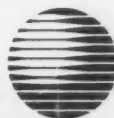


AT&T's UPS is available in 1, 3, 5 and 10 KVA models.

AT&T Power Protection Systems  
Dept. 203130-LEADS, 555 Union Blvd., Allentown, PA 18103  
Please send me more information on UPS and PLC.

Name \_\_\_\_\_  
Title \_\_\_\_\_  
Company \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_  
Phone (\_\_\_\_) \_\_\_\_\_

CW 10/19/87



**AT&T**

The right choice.

hands of novices, is able to apply the heuristic, rule-of-thumb techniques and judgments of experienced human experts to any given problem or incident.

Because expert systems deal with uncertainty in both the knowledge they use and the solutions they derive, they can tackle problems of significantly greater complexity than conventional programs.

Conventional software tools that support capacity planning and performance management contain little or no knowledge about these processes. This lack

and education of new experts is difficult and expensive.

- The expertise is in demand.
- The problem at hand is well defined and solvable but also complex and not easily solved.
- The price of mistakes is high.

#### Benefits and caveats

Huddie Dean, a performance measurement specialist at Chilton Corp. and an early user of

Boole & Babbage's expert system-based DASD Advisor, says that product has saved him hours of time that would have been spent doing diagnostics.

Hewitt Associates' Steinhauer says, "What I accomplished in one day on a PC using ISS-3 would have taken me three or four days on a mainframe using software without expert system capability."

There are, of course, caveats attached to this technology.

Some users and potential customers of expert systems express reservations about allowing an expert system-based product to automatically implement its recommendations. As smart as an expert system may be about performance analysis, it knows nothing about corporate politics, for instance, and its ac-

tions could turn out to be politically absurd.

One capacity planner laughs about the time his expert system recommended installing "so many solid-state devices to handle an overload problem that we could have single-handedly saved Storage Technology from bankruptcy."

Steinhauer observes, "People need to use expert systems

**B**ECAUSE expert systems deal with uncertainty, they can tackle problems of significantly greater complexity than conventional programs.

has traditionally been made up by the analyst using the tools.

By contrast, an expert system, the domain of which is capacity planning or performance tuning, can provide much of this knowledge.

"Expert systems have a proven capability to deal with diagnostic kinds of problems," notes Susan Messenheimer, president of AIM Publications, Inc., a market research and consulting firm in Palo Alto, Calif., specializing in artificial intelligence. "There's a lot of diagnosis to be done in performance management and capacity planning."

#### Opening the door

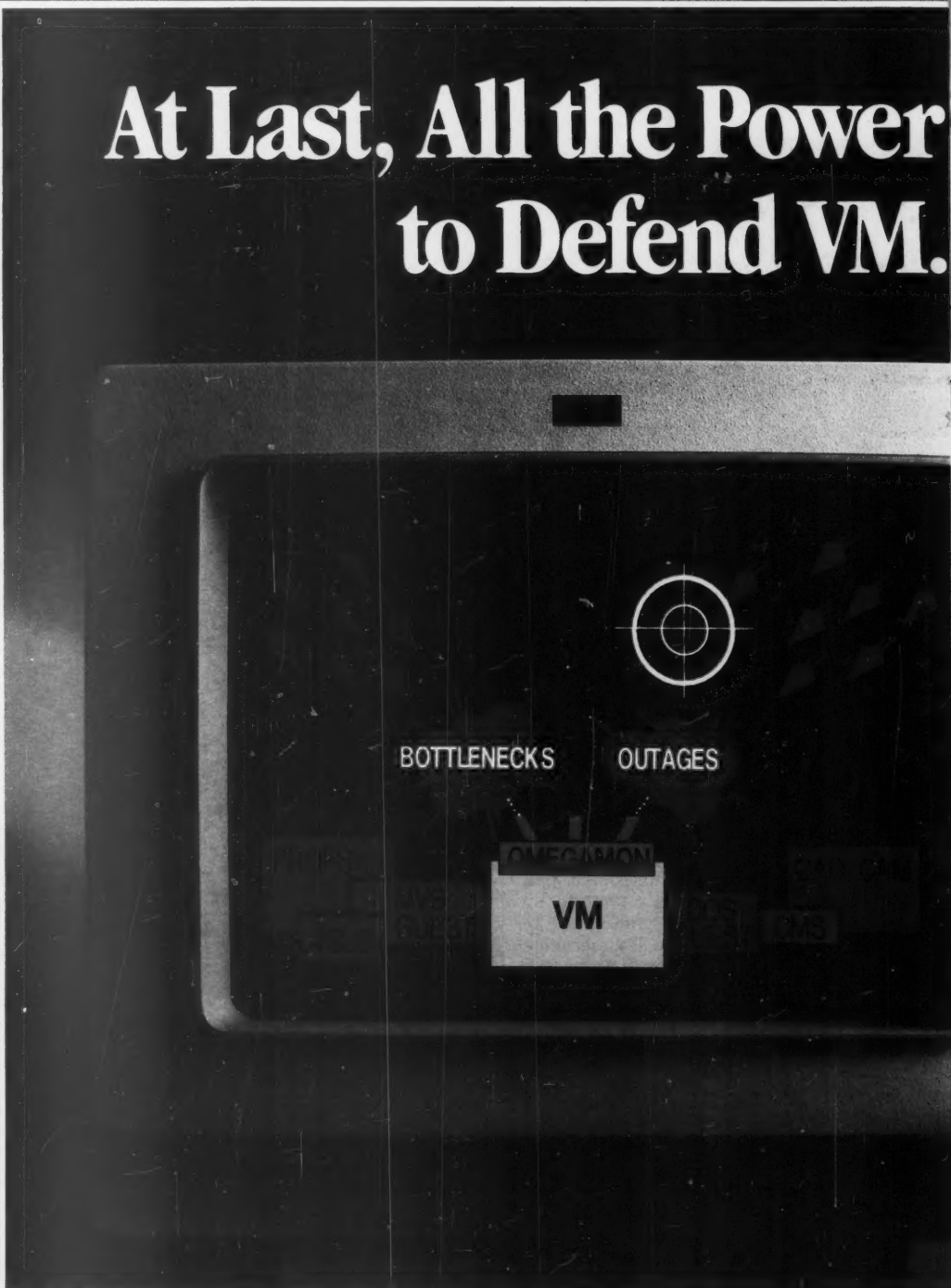
In applying expert system functionality to capacity management — mostly in the form of expert system methodology embedded in conventional software products but sometimes in stand-alone expert systems — the door is opened not so much to new classes of applications but to new classes of users.

Because an expert system can be filled with knowledge about both the performance analysis and capacity planning concepts and the specific models of hardware, it is especially capable of helping comparative nonexperts properly interpret measurement and model results and guide the entire performance management or capacity planning process.

Expert systems are sometimes difficult to cost-justify. However, capacity planners and those concerned with performance management problems get off easy, because their problems are well suited to expert systems. In their case, the following criteria that qualify a problem for an expert system-based solution are met:

- Human expertise is limited,

# At Last, All the Power to Defend VM.



as advisers and apply the reasonability themselves. An expert system has the same pitfalls as all rules of thumb. But as an adviser, it makes you consider options you might not otherwise think of."

Another caveat concerns maintenance of the knowledge base. As the knowledge changes, an expert system's knowledge base must be changed, too. So

knowledge base maintenance cannot be ignored, especially in capacity management, in which the knowledge base contains the ever-changing specifics about particular models of hardware and software products.

Some maintenance can be expected from the vendor; ISS-3's knowledge base, for instance, is updated quarterly. However, users will always need to contrib-

ute their own changes as the organization's understanding of its system needs and organizational goals evolves.

#### One of your own

Most of the tools now available to build expert systems were derived from laboratory efforts to produce expert systems to handle diagnostic problems.

The following list illustrates

some of the areas in which expert systems are emerging in capacity management. While some are available commercially, the majority are either experimental or proprietary and are not yet available in the marketplace.

**Operational control.** On a day-to-day, operational level, data center personnel have relatively little time to execute procedures and prevent problems. If

they hesitate, the data center may not meet its service level agreements, and end-user productivity can deteriorate.

Several expert system-based products help data center and network management personnel maintain operational control by offering them data interpretation, recommendations for further action and sometimes automatic problem solving:

- DEC's Network Troubleshooting Consultant (NTC) is used internally by DEC's worldwide re-

# You Need

Lightning response time and optimum resource utilization—the marks of a winner. And a challenge in any environment. But with VM—well, you have to be a very special kind of professional to manage the complexities of this very special operating system.

#### Defend PROFS, CMS, 4GLs

Keep your scores high with all your users. Gain the advantage with OMEGAMON® for VM, your secret weapon from Candle Corporation.

#### Seize the Initiative with Early Alert

Educated guesswork isn't enough. By the time you find out that the preferred paging area is almost full, it may already be too late to save the ship. But with Exception Analysis, you're warned of threats to response time and availability before they score a direct hit on VM. And before your PROFS and CMS users start calling.

#### Take Aim at the Threat

When you have so many potential problem areas, as you do with 4GLs, you need to isolate the cause of performance degradation...fast. Inadequate spool space? Too much arm movement on a pack? Or are you just flat out of real storage? With OMEGAMON, all the diagnostic information needed to nail down the problem is right at your fingertips.

#### Eliminate the Problem

Once OMEGAMON has helped you pinpoint the problem, it only takes a few keystrokes for authorized staff members to get the cause of the trouble into their sights...and blow it away.

#### With Complete Support

There's a version of OMEGAMON for whatever operating system you're running—XA SE, HPO, SP—and whatever your VM environment—VM/DOS, VM/MVS, or native VM.

Keep the competitive edge you need to manage VM performance. Call Terry Forbes at (800) 843-3970 for more information.

OMEGAMON for VM—all the fire power you need for a computer game that you and your users always win.

## !Candle\*

Candle Corporation

1999 Bundy Drive, Los Angeles, CA 90025

Copyright © 1987 Candle Corporation. All rights reserved.

**T**HE MAJORITY of expert systems are either experimental or proprietary and are not available in the marketplace.

more diagnostic centers. Reported problems, such as downtime or degradation analysis, are consolidated by the telephone support center; NTC supervises the diagnosis guidance programs.

NTC is installed on a VAX and may be linked to Decnet's management function to invoke testing procedures. Its knowledge base is tree-structured, so the possible reasons for any given problem are narrowed down by succeeding questions.

- IBM's Yes/MVS assists operators in monitoring and controlling MVS operating systems. The system helps operators interpret system messages, allocate resources, prevent shutdowns and remember users' priorities.

Yes/MVS runs on VM but has been reimplemented in Yes/LI, a rule-based extension of PL/I.

- Net/Advisor, from Avant-Garde Computing, Inc. in Mt. Laurel, N.J., is a network operator assistant. It works with Net/Command, a Netview-like network management product that coordinates the operator's access with many different sources of network data. The data is sent to the Net/Advisor expert system, which scans its knowledge base for rules that will be sent back to the operator for assistance in problem solving.

- AT&T Bell Laboratories' Troubleshooter coordinates troubleshooting activities in Datakit's large Centrex-style local-area networks. Unlike most expert systems, Troubleshooter can learn how to evaluate new problems.

**System and network administration.** System and network administrators negotiate with end users about service levels. When actual service levels meet the plan, reports on configuration status are generated. If not, a request for performance analysis and tuning is issued. Upon successful tuning or other



changes, the inventory of hardware, software and vendors is recorded. If tuning proves to be of no help, capacity planners get involved, or service level goals are renegotiated.

Thus, system and network administrators deal constantly with segments of the capacity management data base. Expert systems can help the administrator with sophisticated windowing and screen controls, prompts for more data, answers to data base inquiries and confirmation of actions taken. Among the expert systems offering such help are the following:

- Avant-Garde's Net/Advisor maintains an updated configuration data base that includes properties, connections and monitored variables.
- DEC's NTC contains knowledge of configurations for given geographical areas.
- Bell Communications Research Corp.'s Switching Maintenance Analysis and Repair Tool diagnoses and maintains switches through its Operations Support System, which is centrally located and handles many switches.

**Data interpretation.** Part of performance analysis involves occasionally reviewing the output of data reduction and analysis instruments. But these instruments generate too much output on system and network performance for the analyst to quickly interpret or analyze. Expert systems can certainly make interpretation easier by automating it with rules for handling known procedures.

Performance analysts are typically asked to make qualitative judgments for which thresholds can be defined — for ex-

ample, what constitutes "good" or "bad" performance. Even tougher is the quantification of the fuzzy realm between the thresholds; this is what expert system-based tools, such as the following, can address:

- Boole & Babbage's DASD Advisor, the first in a series of expert system-based performance advisers, targets the biggest service-level problems and recommends alternative solutions. Users can ask the system to explain its reasoning, which means the system functions as a de facto training tool.

**Problem management, performance analysis and tuning.** Preventing or correcting system and network outages is high on the capacity management to-do list. Many expert systems address fault diagnosis and make preventive maintenance recommendations. Among them are the following:

- DEC's AI-Spear diagnoses failures in tape drives and suggests preventive actions. Its CDX analyzes VMS dump files after system crashes.
- Lockheed Corp.'s BDS helps locate faulty modules in large signal-switching networks by using test equipment readings to isolate faulty printed-circuit boards or other parts.
- Travelers Insurance Co.'s Diag8100 diagnoses faults and recommends corrective measures for the firm's IBM 8100 computers.
- Prime Computer, Inc.'s DOC finds hard-

ware and software bugs in the Prime 750 minicomputer by examining system memory to locate parity errors, irregular register values, faulty microcode and unterminated lines. DOC compares the state of the memory to a profile of known computer failures.

- Honeywell Bull, Inc.'s Permaid troubleshoots disk subsystem problems, handles subsystem preventive maintenance and

work users' service requirements.

Capacity planning is becoming an important expert system domain, and major software suppliers, such as the following, are embedding expert systems in their products:

- ISS-3's Capacity Planner component includes knowledge of IBM and compatible equipment and recommends configurations that meet user-established growth requirements and service level objectives.
- Best/1, running on MVS, is used primarily for capacity planning. Expert system-based versions for CICS and DB2 will be forthcoming by the end of this year.
- IBM's PEP38 is a capacity planning system for the System/38.

In addition, a growing number of expert systems have system and network configuration as their domain:

- DEC uses several expert systems to design and configure installations. The best known, Xcon, configures VAX systems.
- Honeywell Bull's menu-driven Intelligent Software Configurator automatically configures the DPS6 family of mid-range systems.
- NCR Corp.'s Ocean checks orders and configures NCR computers.
- BBN Communications Corp.'s Designet eases packet-switching network design.

#### Where the limits lie

Clearly, most of capacity management's leading edge points to expert systems. But are there limits to these systems?

"If what you mean by 'expert system' is just procedural code that can do if-then tests, then there are real limits on what expert systems can do," Boole & Babbage's Perry contends.

"But," he continues, "if you require an expert system to have a distinct inference engine separate from its knowledge base, then there is virtually nothing an expert system cannot do as long as the domain is chosen well and you've got a knowledge engineer who can encode expertise into the knowledge base."

Some early users are already looking for more. "I'd like to see it do more what-if analysis," AT&T's Barstow says of Boole & Babbage's DASD Advisor. "I want to know, for instance, how certain actions might downgrade performance. Right now, I get advice about what to move but not where to move it. We need the systems to be smarter." •

**P**ERFORMANCE analysts are typically asked to make qualitative judgments for which thresholds can be defined. Even tougher is the quantification of the fuzzy realm between the thresholds; this is what expert system-based tools can address.

helps systems recover from disk media errors.

Short of encountering outright system crashes when performance monitoring data reveals problems or if operational or capacity planning staff request it, the MIS or data center staff will launch performance analysis and tuning efforts. Tuning demands that large amounts of data be interpreted, correlated and analyzed. Thus, there is a need for diagnosing performance bottlenecks as well as the causes of system failures.

While fewer expert system-based products are aimed at analysis and tuning problems than at crash diagnosis, such problems are an emerging area of concern. The following are some of the tools currently available:

- Boole & Babbage's DASD Advisor uses the data it interprets to do DASD performance analysis and tuning. DASD Advisor recommends actions and offers explanations for its recommendations.

Tim Barstow, a systems programmer at AT&T, notes, "There's a temptation to put in triple-density DASD without much performance information. This tool offers exactly the kind of help we'll need to deal with IBM's new triple-density DASD products."

- General System's TIMM/Tuner tunes DEC VAX/VMS computer systems. According to General System, the performance of the VAX computer on which TIMM/Tuner was developed rose 10% during the building and testing of the product.

- BGS Systems' Best/1 modeling tool, in which expert system capability has been embedded, can be used for performance tuning as well as capacity planning.

**Capacity planning.** Every computer system or network installation requires capacity planning — the process of understanding and predicting the performance of a system or network to maintain sufficient processing capacity.

The tools of performance measurement and data reduction, as well as performance prediction models and configuration guidelines, are all essential ingredients in the capacity planning process. What expert systems can add to this collection of tools is knowledge about capacity planning itself.

A capacity planning expert system contains encoded knowledge about computer performance analysis and capacity planning. This knowledge is required to properly interpret measurement and modeling results and guide the process to a goal consistent with the system or net-

## Meet FRED™

... the only monitor  
which gives you real-time display  
of MVS performance data  
in a graphic format.

It's the next generation  
of performance measurement  
and capacity planning tools.

# 1-800-426-8449

**FORTHRIGHT**  
Systems, Inc.

490 Lakeside Drive • Sunnyvale, CA 94086

FRED is a trademark of Forthright Systems, Inc.



Ask the  
vendor  
about . . .

- Application development tools
- Communications
- Power protection equipment
- Add-in boards

Upcoming Spotlights will explore these subjects. We invite readers to send in their vendor-specific questions in these areas so that we can obtain the answers for you and for others with similar concerns. Write to Deborah Fickling, Associate Editor, Box 9171, Framingham, Mass. 01701-9171.



**COMPUTERWORLD**  
Now in our 20th year!

Reporting  
the future  
since 1967...

Join  
the  
celebration  
and  
save!

**JUST 58¢ AN ISSUE**

**PLUS 12 BONUS ISSUES**

## Fill out and mail in the attached postage-paid envelope.

**YES!** I want to take advantage of this celebration offer... a full year of **COMPUTERWORLD** and the **COMPUTERWORLD FOCUS** issues for just \$29.57, a savings of over \$14 off the basic rate.

- ☐ Payment enclosed
 ☐ Bill me
 ☐ AmEx
 ☐ VISA
 ☐ Mastercard

Signature \_\_\_\_\_ Card Expires \_\_\_\_\_

FIRST NAME	M I	LAST NAME
TITLE		
COMPANY		
ADDRESS		
CITY	STATE	ZIP

Address shown: ☐ Home ☐ Office

☐ I'm already a subscriber, but I'd like to extend my subscription at this special low rate. (Attach mailing label above.)

Canada, Central & South America \$110/ Europe \$165/ All other countries \$245 (Airmail). Foreign orders must be prepaid in U.S. dollars.

Please complete the information to the right to qualify for the special introductory rate.

Basic Rate: \$44

# COMPUTERWORLD

Detach here, place in envelope, and seal securely.

Please indicate your business, function, and computer involvement below.

### 1. BUSINESS INDUSTRY (Circle one)

10. Manufacturer (other than computer)
20. Finance/Insurance/Real Estate
30. Medicine/Law/Education
40. Wholesale/Retail/Trade
50. Business Service (except DP)
60. Government—State/Federal/Local
70. Mining/Construction/Petroleum/Refining/Agric.
80. Manufacturer of Computers, Computer-Related Systems or Peripherals
85. Computer & DP Services, including Software/Service Bureau/Time Sharing/Consulting
90. Computer/Peripheral Dealer/Distrib./Retailer
95. User/Other \_\_\_\_\_

(Please specify)

### 2. TITLE/FUNCTION (Circle one)

- IS/MIS/OP MANAGEMENT**
19. Vice President, Asst. VP
  21. Dir., Mgr., Supvr., IS/MIS/OP Services
  22. Dir., Mgr., Supvr., of Operations, Planning, Adm. Services
  23. Dir., Mgr., Supvr., Analyst, of Systems
  31. Dir., Mgr., Supvr., of Programming
  32. Programmer, Methods Analyst
  35. Dir., Mgr., Supvr., OAMP
  38. Data Comm. Network/Systems Mgt.
- OTHER COMPANY MANAGEMENT**
11. President, Owner/Partner, General Mgr.
  12. Vice President, Asst. VP
  13. Treasurer, Controller, Financial Officer
  41. Engineering, Scientific, R&D, Tech. Mgt.
  51. Sales/Mktg. Mgt.
- OTHER PROFESSIONALS**
60. Consulting Mgt.
  70. Medical, Legal, Accounting Mgt.
  80. Educator, Journalists, Librarians, Students
  90. Others \_\_\_\_\_

(Please specify)

### 3. COMPUTER INVOLVEMENT (Circle all that apply)

- Types of equipment with which you are personally involved either as a user, vendor, or consultant.
- A. Mainframes/Supersystems
  - B. Microcomputers/Small Business Computers
  - C. Microcomputers/Desktops
  - D. Communications Systems
  - E. Office Automation Systems
  - F. No Computer Involvement

336742-9

## INTERVIEW

# TEAMWORK BETTERS PLANNING

Pat Artis is president of the Computer Measurement Group, a worldwide, nonprofit trade association based in Alexandria, Va. He also operates his own consulting firm, Performance Associates, and is a leading authority in work load characterization, forecasting, simulation modeling and capacity planning. The author of more than 75 papers, Artis edits the "Journal of Computer Systems Science and Engineering." He spoke recently with *Computerworld* intern Jeff Goodwin about the misconceptions surrounding performance measurement and capacity planning and possible methods that could be used to integrate these functions more closely with business management.

### Do you think there's any validity to the criticism that current ways of measuring performance aren't really useful?

I would not say they're not useful. The problem lies more with the fact that performance analysts have not learned to translate terminology into information meaningful to management.

Management wants to know more about what the systems are doing and how to estimate future resource requirements, and we're just not communicating that information effectively. The technology and terminology are fine. Where we are falling short is in restating our findings in terms that are meaningful for management.

### So there's a back-end problem, a lack of analysis and translation of data?

The trouble is that we're hung up on exactness. The performance analyst or capacity planner says, "I can't exactly predict next year's work load, so I don't know how to give you a report." That isn't the way businesses work.

A company's pension plan is tied to the cost of living, and its cost of money is tied to the prime interest rate. Neither of these can be predicted with certainty in advance, but the comptroller doesn't say, "Our company is not going to have a budget for next year because I can't guess those values to two digits."

### What is the solution? Will there be tools developed to help integrate performance analysis with business planning?

It's not so much tools that are needed as it is understanding. You have to understand that performance analysts aren't dumb, and they didn't make this problem for themselves. They had help from management.

When capacity planning start-

ed, management said, "This is a hard technical problem." And they went out and hired technicians — individuals who didn't necessarily know anything about the business — and put them in the basement and said, "Go solve this hard technical problem."

Tools aren't going to resolve the situation. What is needed is recognition of the fact that the capacity planner has to get out of the basement, find the users and develop ties with them.

This recognition is just beginning to develop and produce results. In fact, one of the most strikingly successful capacity planning programs I've seen in the last couple of years is one put together at a brokerage house in New York, where they took an MBA who had experience in corporate planning and assigned him two technicians who understood modeling.

### So you think the answer is to pair business managers with technicians?

I truly believe that if it wasn't for what their paychecks said, 50% of all managers at all levels in all computing companies would just as soon be back writing code in the basement. Salary pressure has made managers out of a lot of good technicians.

The capacity planners are trying to grow and change. They are trying to learn how to talk to users and managers. But often, they just don't have the necessary business skills. One of the ways to get better results quickly is to find those skills elsewhere in the company — bring the technicians together with a business planning person and let them cross-pollinate.

**We are, in any case, facing a shortage of personnel who have the expertise needed to use complex monitoring and planning tools. Are performance software vendors**

### going to be forced to deal with the complexity issue?

I think most of them are desperately trying to do that. Certainly, there is a lot of talk now about expert systems.

The thing that worries me about expert systems is that, in turning to them, you run the risk of losing some very important fallback skills.

You have to understand that there has already been a loss of skills as a result of increased reliance on existing tools, that the people who understood all the processes because they had performed them manually are gone.

As soon as you have tools, the most natural approach is to say, "Let's go out and hire some people, and they'll learn through the tools." And the person who has learned to use the tools is well suited to deal with about 80% of all problems but ignorant about the other 20% — the problems that the product doesn't solve either.

### So you don't believe expert systems will improve the process?

Expert systems can improve it, but what we have to recognize is that expert systems have limits, and the more we depend on them, the less prepared we will be to deal with the problems that crop up beyond those limits.

### With the life cycle of systems as short as they are now, how is long-term capacity planning possible?

That's an interesting issue.

Today, the half-life of equipment is probably inching down to 30 months, maybe 24 months, and the capacity planner often has to work within constraints that leave very little room for maneuvering. There is a certain financial inertia built into the data center, with leases and depreciation schedules. In fact, that's one of the reasons that communication and willingness to make projections is becoming such a critical part of capacity planning.

The capacity planner has to be able to provide realistic life cycle expectations on pieces of equipment to the people doing financial acquisition and financial management of the equipment.

### Do you expect the trend toward integrated packages to continue?

I don't see a lot more integration taking place. I do expect that the boundaries between the products will be very formalized, so that you will be able to slide between them very easily.

The performance-product marketplace has matured significantly during the last five to seven years. A number of companies have developed product offerings that are very comprehensive, but what these companies have found is that they reach a certain point beyond which they



Pat Artis

ALAN WITSCHONKE

cannot penetrate.

Users don't want one product that can do everything; they want the freedom of using several products that will work together.

Take Morino Associates and BGS, for example. Morino Associates has a product called MICS, which deals with all measurement data and does accounting and capacity planning — up to a boundary — and performance and reporting of all types. They've totally integrated their marketplace.

BGS, on the other hand, has a product called Best/1, which it has integrated across VM, SNA, MVS and across new product offerings like DB2. If you took their customer lists and put them side by side, there would probably be an 80% overlap.

The users of these products aren't interested in a single-vendor solution. What they've wanted for some time, and what they are now starting to get, is not a total solution from one or the other vendor but accommodations from both vendors that will allow the products to work together.

So the likelihood that anyone's going to come in and succeed with a do-everything package is relatively small. •

## The picture gets clearer with modeling

Many capacity planning and performance management products use a variety of models, including historical trend projections, benchmarking, simulation studies and analytical models based on queuing theory.

Modeling is used primarily to predict the performance of computer systems, but it can also be used to determine performance parameters that are inaccessible, inconvenient or too expensive to directly measure.

Trend projections are limited in that they merely extrapolate from past experience what future events — such as new kinds of systems — will ultimately defy. Benchmarking, on the other hand, uses an example configuration, which means variations are not considered.

Simulation and analytic modeling al-

the utilization of a resource is the product of CPU throughput of that resource multiplied by the CPU service interval at that resource.

Another law, called Little's law, is a modification of the utilization law. It contends that in a steady-state environment, the product of a system's throughput multiplied by the average time spent in the system by a user's request yields the number of requests in the system at any particular moment.

The forced-flow law addresses throughput and service for various serv-

ers. This modeling law states that for all of the components in a system, throughput rates remain proportional to one another.

The Markovian M/M/1 birth and death process is used to figure how much time a user request will be in the system and the number of requests there are in a system queue. The M/M/1 model describes how, with utilization growth, a small increase in utilization corresponds to a large increase in total time in the system.

This means overloaded systems running at an 80% to 90% utilization level are

much more sensitive to work load increases than systems functioning at 60% utilization.

### Inexact, but helpful

Real computer systems and networks deviate from the formulas these and other capacity planning models represent.

The performance model used with the FAA's advanced automation system, for instance, is required to have an accuracy rate of 20% for response times and utilizations, which developers felt was compatible with other system uncertainties.

Although performance modeling is by no means an exact science, it certainly helps performance analysts understand and anticipate performance results.

CAROL WEISZMANN

# CASE Techn

The IEF™ integrated CASE product from  
to deliver the right information systems

lows any number of present or future configurations to be tested. While simulation techniques are often more accurate than analytic ones, they take longer to execute and require the user to establish in advance the configuration being tested. Analytic models offer users the opportunity to determine the configuration they need, given their chosen performance parameters.

### Models in combination

Sometimes using several models is worth the effort.

For instance, the performance model used in designing and testing the Federal Aviation Administration's (FAA) advanced automation system, the world's largest command and control system, has three components: a software model, a work load model and an analytic, or queuing, model.

Analytic, or queuing, models offer a launching point for understanding system performance, even if the ultimate explanations of performance problems cannot be precisely retrofitted to them.

Like so many mathematic disciplines, queuing theory traces its origins to something practical — in this case, the study of the flow of events.

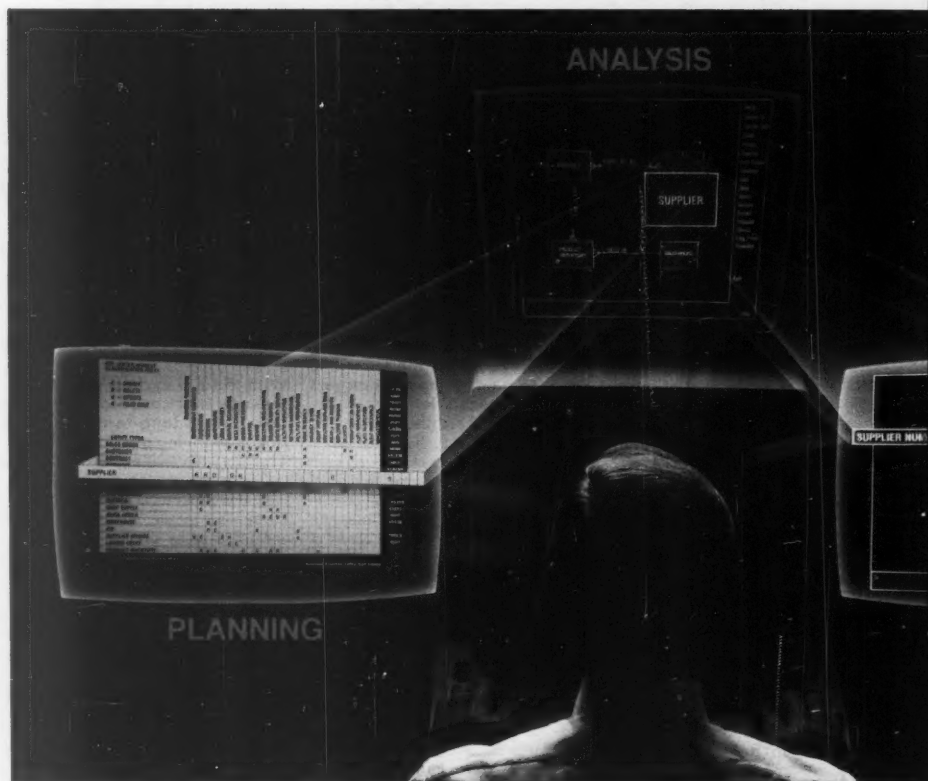
Queuing models help performance analysts make decisions about the systems they are planning or tending, since the models describe relationships between the events that comprise system or network operations.

The single-server queue is the basis for models of mainframe systems. Network modeling is similar, but it tends to get more complicated because of factors like inbound synchronization delays and cluster controllers.

### Rules of the game

A number of rules can help analyze modeling factors such as performance.

The utilization law, for instance, says



IEF supports the entire systems life cycle from planning, analysis, and design through code generation, data-base generation, and maintenance.

The MIS world is being asked to develop innovative information systems with all the speed and accuracy automation makes possible today. The demand for applications is increasing. The Texas Instruments Information



## VENDOR VIEWPOINT

## Separating performance from planning

BY H. FRED SILVER



Many people, including some capacity planners, think capacity planning is just an updated buzzword for performance evaluation. That is a serious misconception. There are, or should be, distinct differences between the two.

Even when a structure has been created under the capacity planning banner,

considerable uncertainty often lingers over some or all of the following issues:

- What needs to be accomplished.
- What to do to meet goals.
- What to expect.
- What tools are available.
- What results can be produced.
- Who is the beneficiary of the results.

The problem is that capacity planning and its derivatives have become popular

panaceas. Many organizations try to implement the capacity planning function without really understanding what it is or what it requires, simply because they believe it is "the thing to do."

A recent conversation with the newly appointed manager of capacity planning at a large, well-known data processing company provides a good example of putting structure before understanding.

This person, having been handed a new title and a vague outline of his responsibilities, was calling for help in defining the job he was expected to perform. He had, he said, no idea what this function was or how to write a set of objectives for it, and, furthermore, he wasn't sure what his management expected. During the course of our discussion, several specific questions and issues were raised:

- Can the performance analyst and capacity planner be the same person? Should they be?
- Can they be on the same team? Again, should they be?
- Do capacity planners need to be highly technical, or can they possess average technical ability?
- Should capacity planners be concerned with today's performance, future performance or both?
- Should the capacity planner report to technical managers (line function) or to higher level managers (staff function)?

This manager was astute enough to sense what many organizations and individuals still do not — that capacity planning should be something more than just an extension of performance evaluation activities.

**Critical distinctions**

There is no question the two functions are related, but there is more distance between them than is commonly assumed.

Performance evaluation is the process of understanding, optimizing and tuning the environment already in place. Capacity planning is the process of determining the resources that are needed to satisfy anticipated requirements. It is generally directed at solving specific DP problems or tuning the performance of existing hardware, software and applications environments.

Capacity planning takes a broader view. Its only interest in current performance is as a starting point for projections about future requirements.

Because many assumptions must be made and guesswork done to project performance and resource demands, capacity planning does not require the same degree of precision as performance evaluation. When dealing with projections, accuracy is measured in ranges of percentages rather than in fractions of seconds.

Not surprisingly, the two disciplines require different skills and temperaments. Performance analysis is essentially a low-profile support activity. Its practitioners tend to be technically oriented, proficient with tools and utilities. On the other hand, capacity planning offers the potential for high visibility, because the results of capacity planning studies usually support top management's decisions.

Capacity planning requires fewer technical skills than performance evaluation does, but it also demands a broader knowledge base. Capacity planners must understand the organization and its goals, as well as how to relate these goals to practical matters, such as software life cycle management and software performance engineering.

True capacity planning is very different from performance evaluation. Simply changing a title or creating a new slot on the organizational chart will not transform performance numbers into plans for the future. •

Silver is vice-president of Performance Systems, Inc., an organization that assists its customers in performance evaluation and capacity planning.

# ologies:

## Texas Instruments enables you faster with better quality.

"After an 18-month investigation of systems-development methodologies, we adopted Information Engineering because of its rigor and breadth. It supports the entire systems life cycle."

—Dale Hull, Amoco Corporation

The IEF automates the widely accepted Information Engineering methodology. Information Engineering focuses on shared data and processes to build systems. With it you can put systems in place faster, with greater accuracy, fewer revisions, less maintenance, and full documentation. The IEF has revolutionized the group of products that has come to be called CASE.

In supporting the planning, analysis, and design stages of the systems life cycle, the IEF provides a series of diagrams to speed development, improve accuracy, and enhance communication with your users. The information derived from the diagrams is stored in the form of a business model in a central encyclopedia. Subsets of the model can be used simultaneously by multiple systems developers and then merged back into a consolidated model of the business. Code and data bases are automatically generated from the information contained in these models.

"We have achieved higher-quality results in less time using IEF. It facilitated the integration of data and processes during systems analysis and provided more complete documentation."

—Tom Funk, U.S. Navy

Texas Instruments provides a full range of support services to assist you in providing systems solutions to business

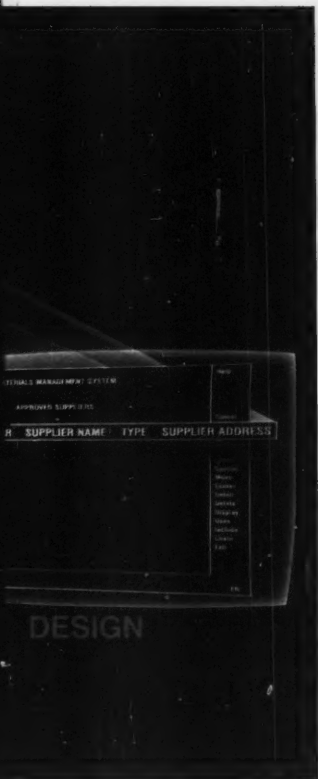
problems. Our product support includes embedded help, software guides, and methodology documentation. Training and consulting services can be conducted at your site or at TI.

"With an eye toward the future, TI is investing more than \$400 million a year in research and development. A focus of our R & D is the key technologies of the information age, including Expert Systems, Object-Oriented Data Bases, and Natural Language. Aspects of these technologies have already been introduced in our CASE product and hold significant promise for advanced versions of the IEF. We're committed to CASE. We believe IEF truly defines the term Computer-Aided Software Engineering." —George H. Heilmeyer, Senior Vice President and Chief Technical Officer, Texas Instruments Incorporated.

Find out how TI's Information Engineering Facility can change the way you look at the future. For more specific product information, call (214) 575-4404. Or write IEF Sales and Marketing, Texas Instruments Incorporated, P.O. Box 869305, MS 8474, 6550 Chase Oaks Blvd., Plano, Texas 75086, for our IEF brochure, which gives more information on the whole integrated product.

™ IEF and Information Engineering Facility are trademarks of Texas Instruments Incorporated. The IEF product has been developed with the contribution of James Martin Associates Ltd.

**TEXAS  
INSTRUMENTS**



Engineering Facility™ (IEF) CASE product can help you meet this demand as well as the challenge of your expanding role in the development of information-based products and services that give your company a competitive advantage.

27-203

© 1987 TI

# Modeling tools

## Adesse Corp. (203) 431-3071 VM/SP Performance Analysis/ Capacity Evaluation Subsystem

A benchmarking tool that simulates IBM 3270-class terminal devices. Uses preprogrammed scripts to predict and measure the effects of software and hardware changes. Runs on any IBM 370 or compatible and executes under CMS in a virtual machine.

## Amdahl Corp. (408) 746-6000 SURF/IMS

A modeling tool that assists in managing system software in an IMS/VS environment. Allows users to exercise system components under controlled conditions to predict a system's behavior in a production environment. Tests system software performance, provides capacity planning information and prototypes new as well as existing applications.

## Axios Products, Inc. (516) 348-1900 Pilot/CICS

Formats mainframe data for transfer to the personal computer and utilizes Lotus Development Corp.'s 1-2-3 to perform CICS tuning, modeling, analysis and forecasting. Measures systemwide statistics as well as various response-time statistics. Allows comparison of projected work loads for different CPUs, dispatching priorities, disks and main storage types.

## Pilot/MVS

Formats mainframe data for transfer to the PC and utilizes 1-2-3 to perform MVS graphics analysis, tuning, tracking and predictions. Provides resource management facility summary, work load, direct-access storage device, TSO summary and channel reports.

## BGS Systems, Inc. (617) 891-0000 Best/1 MVS

Predicts the effect on systems response time and throughput of specific operating system or hardware equipment changes. Uses MVS monitored data as well as its own performance data base of IBM (or plug-compatible) equipment to build models that accommodate performance timing and capacity management needs.

## Best/1 VM

Performs same functions as above product within VM environment.

## Best/1 SNA

Performs same functions as above products within an IBM Systems Network Architecture environment.

## Crystal

Predicts the IBM mainframe capacity requirements of any proposed new application. Uses an application description from the user and its own subsystem libraries for IMS and CICS as input.

## Boole & Babbage, Inc. (800) 538-1893 Model 300

A performance/capacity planning software package that measures ap-

plication resource consumption, performance bottlenecks, work load growth trends, impact of new work loads and effects of upgrading direct-access storage device or processors. It also projects CPU capacity saturation point. Actual system performance used to automatically verify baseline model.

## Computer Technology Associates, Inc. (703) 848-2700

### Performance Analysis Tool Box

A performance analysis tool that allows representation of centralized and distributed computer architectures. It can be used to model packet- and message-switched wide- and local-area networks.

## Datametrics Systems Corp. (703) 425-1006 Capacity/Q

A personal computer-based tool that models multiuser systems to determine need for more resources. Predicts how a particular work load increase will affect overall system performance and when hardware upgrades will be needed. Model outputs include utilization levels, batch throughput and turnaround times.

## Information Builders, Inc. (212) 736-4433 Focus Design Analyzer

A data base design analysis and simulation tool that runs on IBM VM/CMS or MVS/TSO. Allows user to prototype data base designs and forecast the effects of worst-case scenarios. Simulates relative data base I/O and disk space of proposed data base designs and populations from existing or planned structures.

## Important Breakthroughs From Candle

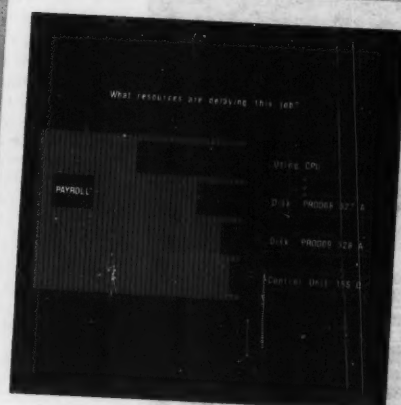
# Get Solutions To Complex As Easy As



1. Identify overdue  
Jobs with WPF.

Face it. You've got a tough job. It's not easy to maintain overall system productivity and manage an ever increasing number of individual jobs. But now you can optimize your resources to do both—if you've got the latest release of Candle's MVS performance products.

Breakthrough features in this integrated family of products make it as easy as 1, 2, 3 to find out which resources are impacting MVS and impeding system performance. So you can take action fast and avoid customer complaints.



2. Locate the resource problem  
with Impact Profiles.

### WPF

Workload Profiling Facility (WPF)\* of OMEGAMON® automatically warns you about a job that's taking longer than usual. So you can identify a production job in trouble and take action before customers complain or deadlines are missed. What's more, WPF actually sets your job thresholds for you.

### Resource Impact Profiles

A second breakthrough tool called Impact Profiles





# Users learn dollars and sense

BY PHIL HOWARD

A class of proprietary software products, generally called job accounting packages, calculate dollar charges for computer resource use by applying rates to

measured system usage. Users are then charged or invoiced for the amount of services used.

Chargeback is not a prerequisite to capacity management,

but it does place the responsibility for accurate forecasting where it belongs — squarely on the shoulders of the end user. Good forecasts are essential to

good capacity planning. When users have clear budgetary responsibility for computer resource use, they tend to behave in a more rational, economic way. This helps make the capacity planning process much more accurate and dependable.

When chargeback is used, it establishes feedback between MIS and users. It encourages more effective use of resources

and removes politics from resource allocation. It promotes end-user involvement in basic MIS decisions as well as greater efficiency within MIS itself.

This method of charging differs from cost accounting in that the latter identifies and accumulates costs relating to the MIS function and allocates these costs to work centers. The function of chargeback is to translate these costs to rates, or cost per unit of usage, apply pricing strategies and compute user charges based on those rates.

## Which method is right?

Generally, the decision of how to compute user charges becomes a choice between an algorithm-based method and a business unit-based one.

**C**HARGEBACK places the responsibility for accurate forecasting where it belongs — squarely on the shoulders of the end user.

The algorithm-based method, which is used by most job accounting packages, applies dollar rates to measured use to arrive at a charge based on actual resource utilization. MIS must decide which resources to apply to arrive at the charge and how to measure their use and compute associated costs.

An approach based on business units applies a standard cost to a unit of activity such as number of accounts, transactions or invoices. It is much easier to communicate to the user community with this method than with the charging algorithm, since users relate more naturally to the concept of business units.

A bank branch manager, for example, may have a good idea of the number of accounts at his branch but almost no understanding of what this might require per month in the way of CPU time. If he knows the cost per account, he can budget for computer service easily.

The business unit approach is far more simple and eliminates the variability in charging that often occurs with an algorithm-based approach. However, few organizations now use it successfully, largely because arriving at an appropriate charging unit is sometimes difficult.

MIS personnel does not always think of the chargeback approach to measure service. But just as poor response time can cause user dissatisfaction, unsubstantiated or apparently excessive charges are just as disturbing after services have been rendered. \*

Howard is president of Applied Computer Research, Inc. in Phoenix.

## With The New VITAL SIGNS™ VM Performance Monitor, If You Don't Like The Future You Can Change It. Even Before It Arrives.



Just think how easy your decisions would be if you could see into the future. And imagine the exciting prospect of throwing away what you know won't work. Even before you've actually tried it. VITAL SIGNS™ allows you this luxury. Its DASD modeling feature is the first ever to be included in a VM Performance Monitor. So you can perform "What If" analyses for different storage devices, channel loads, file block sizes and input/output loads. And that's just the beginning.

VITAL SIGNS also has both real-time and historical reporting facilities fully integrated into a single comprehensive product.

You can have all major performance measures in both tabular and color graphical formats. Comprehensive DASD seek analyses facilities, such as a Volume Seek Map, are included. Exception reporting facilities provide early warnings of approaching problems. And an easy to use data extraction facility lets you pull specific data from VITAL SIGNS for further analysis or transportation to external analytical software like Lotus 1-2-3.

To find out more about VITAL SIGNS and its low site licensing fees, call 1-800-826-0313, or 612-542-1072.

**BlueLine™**  
SOFTWARE INC.

1500 South Lilac Drive, Suite 340  
Minneapolis, MN 55416  
800-826-0313  
612-542-1072 (In Minnesota) Telex: 6503124329

New advances  
in Performance,  
Productivity and Planning.



# Better performance through engineering

BY CONNIE SMITH

Software performance engineering (SPE) is a method of constructing software systems to meet performance goals. It uses the standard engineering practices to assess, before construction, the correctness, feasibility and desirability of software designs.

In SPE, the user models software requirements and designs and evaluates whether the predicted performance parameters meet specified goals. The process continues through the detailed design, coding and testing stages to more precisely model the software and its predicted performance and monitor actual

commercial products combine the software models with the system models.

Model results are limited by the precision of the input parameters, however. Performance specifications for new software systems are seldom precise, so it is crucial to monitor software as it evolves and compare measured performance with predictions.

The SPE process currently requires several products. No single product offers all of SPE's functions. Some provide early performance benchmarks. Others measure and report key performance indicators. Still others report response time and resource usage to software code.

## The missing tools

Many products currently support SPE tasks, but none provides an ideal combination of features. In the future, integrated products will make SPE much easier.

Data collection instrumentation will be integral to new software systems. Collection will be automatic; measurements will be automatically related to software models, and discrepancy reports will be automatically generated.

Expert systems will also play a larger role in SPE in the future. In the near term, they will detect performance problems and their causes. Later, they will examine software requirements, designs and programs and suggest improvements.

Products to support SPE are necessary but not yet sufficient. They are needed to automate the tedious and error-prone analyses, because timely results are vital.

However, the goal of SPE is not to produce analysis results — it is to develop a system that meets performance goals with reasonable computer capacity. To be successful, a performance engineer also needs to be proficient in SPE methods. With the products and skills, it is easy to build performance into new systems. ●

**U**SERS' perceptions of DP services are often based more on system responsiveness than functionality.

performance against predictions.

The goal is to maximize response time or throughput as seen by users. Responsiveness dictates the amount of work that can be processed, so it determines a system's effectiveness — both perceived and real. Users' perceptions of DP services are often based more on system responsiveness than functionality.

While SPE focuses on software development, it is also an important aspect of capacity management. Accurate planning requires resource consumption estimates for new applications and for the effect of current work growth on computer resource requirements. SPE provides both.

It assists the capacity management effort by making it possible to examine the costs and benefits of resolving imbalances by increasing system capacity instead of modifying the software requirements or designs.

## Models support planning

Modeling tools are the primary products that support capacity planning.

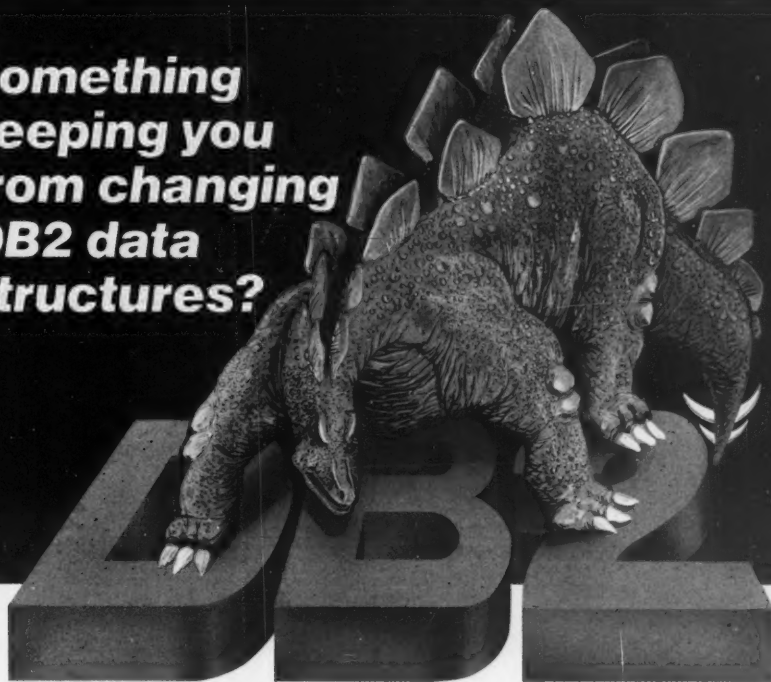
Planning for growth in existing systems uses parameters from measurement data combined with demand projections. For new software systems, parameters come from software execution models, which are usually developed in SPE performance walk-throughs.

These models can be created with a calculator, spreadsheet, statistical analysis package or customized program. Commercial products are also available for simulating execution or analytically examining software models to produce system model parameters.

Commercial products for creating capacity planning models with simulation or analytic methods are currently used to predict new software performance and quantify resource requirements and the competitive effects of new software on existing systems and vice versa. Some

Smith, a performance engineering consultant based in Santa Fe, N.M., is a principal of L&S Computer Technology, Inc. in Austin, Texas.

# Something keeping you from changing DB2 data structures?



Changeasaurus—(CHANGE-a-SAU-rus)

It's not that you can't make a change; it's what happens when you do make a change. Changeasaurus, that jealous guardian of the DB2 catalog, is dangerous when provoked. Because of the demands of Changeasaurus, DBAs have spent upwards of 50% of their time battling complex change procedures.

But those days are gone. Now there's DB2 ALTER from BMC Software, which supports all changes to attributes of objects. DB2 ALTER automatically restores data, dependencies and authorizations. It features commit-point control and restart capability, and Rename, Migrate and Create Like commands.

DB2 ALTER provides:

- Complete control of the change process
- Reduced development and maintenance costs
- Elimination of costly user coding errors

For more information, or to begin a 30-Day-Plus Free Trial on DB2 ALTER, mail the attached coupon, or call BMC Software.

**1-800-841-2031**  
in the USA or (713) 240-8800  
1 800 231-2698 in Canada

**BMC**  
SOFTWARE

BMC Software, Inc.  
P.O. Box 2002 • Sugar Land, TX 77487-2002

CW

- ☐ Contact me about a 30-Day-Plus Free Trial of DB2 ALTER.  
☐ Contact me with more information on DB2 ALTER.

Name

Title

Company

Address

City  State/Prov.  Zip/PC

Telephone

# Performance monitoring tools

COMPANY	PRODUCTS	OPERATING SYSTEM	ENVIRONMENT MEASURED	HARDWARE REQUIRED	MAJOR FUNCTIONS	INCLUDES REPORT GENERATOR	TYPES OF REPORTS PRODUCED	GRAPHICS ANALYSIS OF DATA	ON-LINE REAL-TIME REPORTING	DATA ARCHIVING	CAPACITY PLANNING AIDS	MODELING FEATURES INCLUDED	INTERFACES	PRICE
AIM Technology, Inc. (415) 856-9649	AIM Disk Tuner	Unix	File usage and disk I/O	Unix systems with standard System V file system	Monitors and analyzes file usage, generates tracking reports, develops and implements layout strategy	Yes	I node activity, interleave, access activity histogram, protected performance histogram, cylinder access analysis	Yes	No	Yes	I node activity report, interleave report, access activity histogram, performance histogram, cylinder access analysis report	No	No	Contact vendor
	AIM Job Scheduler	Unix	Program usage	NA	Monitors program usage, sets program scheduling limits	Yes	Scheduler queue reports, scheduling statistics reports, daily job history	No	Yes	Yes	Scheduler queue, scheduling statistics, daily job history	No	No	Contact vendor
	AIM Job Accounting	Unix	Resource usage	NA	Monitors login time, CPU time and disk usage; tracks resource usage by users and groups of users; builds usage information data base; generates usage and chart statements	Yes	Reports by resources, users, time periods	No	Yes	Yes	Resource usage data base	No	No	Contact vendor
	AIM Benchmarks	Unix	Functional characteristics and applications	NA	Monitors, compares and reports performance	Yes	Functional analysis results, application analysis results, response time analysis	Yes	No	Yes	Data bases and reports	No	No	Contact vendor
Allen Systems Group, Inc. (513) 832-0154	Shopmon	MVS/XA, MVS/SP	MVS, Cullinet IDMS (monitors both simultaneously)	Any system running MVS	MVS, MVS wait and MVS exception analysis, IDMS analysis, IDMS exception analysis	No	NA	Yes	Yes	Yes	Records statistical information used in capacity planning	Yes	No	\$18,250-\$29,600 (depending on configuration)
Amstatco, Inc. (408) 479-0415	Ansmatt	MS-DOS	Industrial measurement sensors	IBM PC, XT, AT and compatibles	Data acquisition, process control, graphics displays, trend plots, system efficiency analysis	No	NA	Yes	Yes	Yes	Plotting and analysis of real-time process variables	Yes	1-2-3, Symphony, any ASCII file, Allen-Bradley protocol	\$395-495
Applied Data Research, Inc. (201) 874-9000	Look	MVS/XA, DOS/VSE	Operating system, teleprocessing monitor (CICS), batch jobs, DBMS performance, Roscoe (on-line programming system)	IBM mainframe	Real-time performance measurement, threshold monitoring for early warning, extended historical analysis, graphics reporting, customization	Yes	Summary reports of statistical findings, histograms and point plots	Yes	Yes	Yes	No	No	Proprietary	\$35,000 (MVS), \$12,000 (CICS monitor), \$18,000 (VSE version)
Axios Products, Inc. (516) 348-1900	Pilot/MVS	OS, MVS, MVS/XA, CICS	MVS, MVS/XA	IBM mainframe, PC with 3270 and file transfer capabilities	Downloads formatted data for analysis on PC, analyzes RMF data directly from system data sets for reporting and tracking, tunes MVS by work loads, provides graphics presentations	Yes	RMF summary, work load, DASD, TSO summary, channel	Yes	No	Yes	Through work load reports, RMF summary reports	No	Reads all releases of RMF and SMF data	\$5,000
	Pilot/CICS	OS, MVS, MVS/XA, CICS	CICS performance	IBM mainframe, PC with 3270 and file transfer capabilities	Downloads formatted data for PC analysis, analyzes CICS data for reporting and tracking, tunes CICS, generates CICS by region using an analytic model, models complex CICS environments	Yes	Summary reports, response time	Yes	No	Yes	Model generators, simulation	Yes	—	\$5,000
Bear Computer Systems, Inc. (800) 255-0662, (818) 508-1894 (Calif.)	I-mon	VMS	Applications processes	DEC VAX	Collects CPU usage data on any currently running process; monitors displays at runtime or in batch; displays data according to variety of qualifiers	Yes	Histogram by routine, detail histograms by line number within a routine, CPU modes for single process, scheduling states for single process, page faults by routine	Yes	Yes	Yes	Measures the impact of a single process	Yes	No	\$500-\$9,000 (depending on configuration)
	F-mon	VMS	System service calls made by the program	DEC VAX	Intercepts and prioritizes all system service calls, generates reports of intercepted calls, modifies system service calls from outside user program	Yes	Detail and brief reports by selective service	No	Yes	No	Analysis of individual program's use of resources	Yes	No	\$500-\$9,000 (depending on configuration)
	Virtual Disk	VMS	Disk I/O	DEC VAX	Records individual disk I/Os	Yes	Individual disk I/O reports	No	Yes	No	No	Yes	No	\$500-\$9,000 (depending on configuration)
	E-mon	VMS	Ethernet	DEC VAX	Shows Ethernet operations and statistics to all nodes, shows histograms of packet sizes and spacing, shows protocols, introduces a known load	Yes	Histograms, summaries, detail reports, dynamic reports	Yes	Yes	Yes	Analysis of data and ability to introduce known loads	Yes	No	\$500-\$9,000 (depending on configuration)
	D-mon	VMS	Disk usage	DEC VAX	Generates on-line alarms for low disk space and reports on disk usage by directory tree, reports history, assists in creating disk quotas	Yes	Directory tree with summary, history, largest file	Yes	Yes	Yes	History reporting	Yes	No	\$500-\$9,000 (depending on configuration)

\*Resource Management Facility \*Direct-Access Storage Device \*System Management Facility \*Systems Network Architecture \* Initial Program Load

The companies included in this chart responded to a recent telephone survey conducted by *Computerworld*. Further product information is available from the vendors.

**Start your  
subscription now,  
and save over \$14!  
JUST 58¢ AN  
ISSUE**

For over 20 years, COMPUTERWORLD has covered the ever-changing field of information systems like no one else. And we're moving into the next generation of technological advances with an expanded staff, more features, and the same determination to keep you on top — and slightly ahead — of new developments. Join the celebration! One full year (51 issues) costs just \$29.57, a savings of over \$14 off the basic rate, and only 58¢ an issue!

**PLUS 12 BONUS ISSUES**



When you subscribe to COMPUTERWORLD, you also get 12 monthly issues of Computerworld Focus, FREE. Each issue covers one particular topic — in depth. Topics include microcomputing, communications, software, connectivity, and much, much more. Leading edge information — for subscribers only!

**Subscribe today by returning the order form in this postage-paid envelope now!**

Or for even faster service . . .

**CALL**

**1-800-255-6286.\***

**And we'll start your subscription immediately.  
Order today!**

\* (In New Jersey call 1-800-322-6286.)



NO POSTAGE  
NECESSARY  
IF MAILED  
IN THE  
UNITED STATES



**BUSINESS REPLY MAIL**

FIRST CLASS PERMIT NO. 55 NEPTUNE, NJ 07754

POSTAGE WILL BE PAID BY

CIRCULATION DEPARTMENT

**COMPUTERWORLD**

P.O. Box 1565  
Neptune, NJ 07754-9916





## CAPACITY PLANNING/PERFORMANCE MONITORING SOFTWARE

## SPOTLIGHT

COMPANY	PRODUCTS	OPERATING SYSTEM	ENVIRONMENT MEASURED	HARDWARE REQUIRED	MAJOR FUNCTIONS	INCLUDES REPORT GENERATOR	TYPES OF REPORTS PRODUCED	GRAPHICS ANALYSIS OF DATA	ON-LINE, REAL-TIME REPORTING	DATA ARCHIVING	CAPACITY PLANNING AIDS	MODELING FEATURES INCLUDED	INTERFACES	PRICE
BGS Systems, Inc. (617) 891-0000	Capture MVS	MVS	MVS work load	IBM mainframe	Monitors daily usage using RMF and SMF data, shows how each application uses entire system, shows detailed view of I/O subsystem, presents reports and graphs for systemwide use, builds model for Best/1	Yes	Shows resources consumed by each application for each system component	Yes	No	Yes	Aids in capacity planning	Yes	Proprietary	\$10,000-\$12,000
	CICS Support Feature	MVS	CICS	IBM mainframe	Uses CICS monitor data to show detailed transaction performance, shows how each CICS transaction uses system components, characterizes work loads consisting of aggregations of CICS transactions, builds CICS models for analysis	Yes	Detailed and summary reports of CICS transactions	Yes	No	No	Aids in capacity planning	Yes	Proprietary	\$9,500
	Capture VM	VM	VM operations	IBM mainframe	Uses CICS monitor data to show detailed transaction performance, shows how each CICS transaction uses system components, characterizes work loads consisting of aggregations of CICS transactions, builds CICS models for analysis	Yes	Shows resources consumed by each application for each system component	Yes	No	Yes	Aids in capacity planning	Yes	Proprietary	\$10,000-\$12,000
	VM Applications Planner	VM	VM/CMS applications usage	IBM mainframe	Monitors VM/CMS applications usage, shows system resources consumed by each application, provides real time view of applications currently active, builds reports and graphs showing applications use of system resources and models for Best/1	Yes	Graphs and charts of VM/CMS applications	Yes	Yes	Yes	Builds model for Best/1	Yes	Proprietary	\$7,000-\$9,000
	Capture SNA	MVS, VM	SNA* networks	IBM mainframe	Monitors network response time and throughput for SNA networks, monitors performance for each network component, reports networkwide performance, builds model for Best/1	Yes	Response time and throughput for SNA network charts	Yes	No	Yes	Builds model for Best/1	Yes	Proprietary	\$35,000-\$45,000
B. I. Moyle Associates, Inc. (612) 933-2885	BIM-ODIS	DOS/VSE, OS/MVS	CICS system status display program	IBM mainframe	Display of current status of operational CICS system and many OS and DOS system control areas, detail and summary displays, analytic displays for problem determination	No	NA	Yes	Yes	No	On-line CICS system status display	Yes	Yes	\$4,800 (OS permanent license), \$2,400 (OS annual lease), \$2,800 (DOS permanent license), \$1,400 (DOS annual lease)
	BIM-MONTR	DOS/VSE	System status performance and power queue display	IBM mainframe	Displays internal system performance variables (paging rate, CPU utilization, device I/O accounts), displays current system and partition status, power queue entries, power queue alteration commands to power	No	NA	Yes	Yes	No	Displays internal system performance variables, displays current system and partition status, power queue entries	Yes	Yes	\$1,200 (permanent license), \$600 (annual fee)
Blue Line Software, Inc. (612) 543-1072	Vital Signs	VM	Hardware in the operating system	Any hardware supporting VM operating system	Real-time and historical reporting, DASD modeling, data extraction to SAS, DASD seek analysis, mean facility, exception monitoring	Yes	Tabular reports, plots	Yes	Yes	Yes	Trend analysis, statistical analysis	Yes	Extract and feed data into SAS, Lotus 1-2-3	Contact vendor
BMS Computer, Inc. (415) 938-2620	CIMS	MVS, VSE	Job status	IBM mainframe and compatibles	Job step monitoring, device usage reports, data set utilization, multiprogramming	Yes	CPU usage; disk usage; I/O utilization; daily, weekly and monthly utilization; end-of-job	No	No	Yes	No	No	No	\$9,500 (MVS), \$7,500 (VSE)
Boole & Balhage, Inc. (408) 735-9550	Resolve Plus	MVS, MVS/XA	MVS performance	IBM 4380	Warns of system problems, reduces operation time and errors, reduces scheduled IPL, encourages rapid problem resolution, increases operator productivity with MVS-like utilities	No	NA	Yes	Yes	No	No	No	No	\$19,000 (MVS), \$24,000 (MVS/XA)
	CICS Manager	DOS/VSE, MVS, MVS/XA, CICS	CICS performance	IBM 4380	Displays warning when service levels are not meeting user-specified thresholds, corrective action can be initiated on-line to ensure immediate results, separate address space operations, flags files with high task waiting times	Yes	Build-your-own batch reports	Yes	Yes	Yes	No	No	MICS	\$8,000 (DOS/VSE), \$16,500 (MVS)
	IMS Management Facilities	MVS, MVS/XA, IMS/VS DB/DC	IMS performance and resources	IBM 4380	Increases system availability, automatically responds to IMS problems to prevent service degradation, warns of high resource utilization levels, monitors multiple IMS systems from one terminal, graphics data display	No	NA	Yes	Yes	Yes	No	No	CMF Monitor, MICS	\$15,000-\$24,000
Business Computing Design (312) 990-0900	Manage-Mix	SSP	Disk and memory utilization and analysis	IBM System/36	25 screens and reports to improve resource and disk management; shows how to balance files properly across disk drives	Yes	25 screen and hard-copy reports	Yes	Yes	Yes	Disk usage analysis vs. what is allocated	No	No	\$950

## CAPACITY PLANNING/PERFORMANCE MONITORING SOFTWARE

## S P O T L I G H T

COMPANY	PRODUCTS	OPERATING SYSTEM	ENVIRONMENT MEASURED	HARDWARE REQUIRED	MAJOR FUNCTIONS	INCLUDES REPORT GENERATOR	TYPES OF REPORTS PRODUCED	GRAPHICS ANALYSIS OF DATA	ON-LINE, REAL-TIME REPORTING	DATA ARCHIVING	CAPACITY PLANNING AIDS	MODELING FEATURES INCLUDED	INTERFACES	PRICE
Candle Corp. (213) 207-1400	Delatmon	MVS SP/1, SP/2 (XA)	Changes to system software, operational procedures, hardware configuration, load libraries, specified data sets	IBM CPU and compatibles capable of running MVS	Identifies unplanned, unauthorized or accidental changes affecting system performance; verifies implementation of planned changes and provides an audit trail when performance problems occur it determines "what changed"	Yes	Change summary, current status of any monitored resource, status changes of any monitored resource	No	Yes	Yes	No	No	Epilog/MVS (proprietary)	\$15,000-\$17,000
	Epilog 1000 for CICS	MVS SP/1, SP/2 (XA), DOS/VSE, SP	CICS	IBM CPU capable of running CICS, MVS/SP/1 or SP/2	Reports on service levels and resource utilizations with data collection and support for MRO/ISC	Yes	More than 36 user-selected reports	Yes	No	Yes	Yes	No	Includes conversion utility to support software that requires IBM CMP format data	\$2,000-\$6,000
	Epilog for MVS	MVS SP/1, SP/2 (XA)	Service levels, resource utilization, sources of contention for TSO, batch jobs, started tasks	IBM CPU and compatibles capable of running MVS, 100-150 cylinders of 3390 DASD	Automatic navigation from service levels to resource contention and utilization via batch reports or interactive inquiry	Yes	More than 36 user-selected reports	Yes	No	Yes	Through SAS interface	No	SAS interface	\$19,500-\$24,500
	Epilog for IMS	MVS SP/1, SP/2 (XA)	IMS Release 1.3 and higher	IBM CPU and compatibles capable of running MVS	Monitors service levels, resource utilization and sources of contention for IMS work loads; automatic navigation facility speeds, analysis of complex performance problems	Yes	More than 36 user-selected reports	Yes	No	Yes	No	No	No	\$19,500-\$24,500
	Response Time Analyzer for IMS	MVS SP/1, SP/2	IMS response time for selected work loads can be monitored by time of day, time interval or on an exception basis	IBM CPU capable of running IMS	Time slot, time interval, moving slot and work load (transaction group) analysis	Yes	NA	Yes	Yes	No	No	No	No	\$9,500-\$10,500
	Response Time Analyzer for CICS	MVS SP/1, SP/2, DOS/VSE SP	Selected work loads can be monitored by time of day, time interval or on an exception basis	IBM CPUs capable of running CICS	Time slot, time interval, moving slot and work load (transaction group) analysis	Yes	NA	Yes	Yes	No	No	No	No	\$1,800-\$10,500
	ESRA/CICS	MVS SP/1, SP/2 (XA)	CICS	IBM CPU capable of running CICS	Intelligent performance monitor identifies CICS performance problems and analyzes the causes	Yes	Automatically customized reports to match performance problems	Yes	No	No	No	No	No	\$13,500-\$14,500
	Omegamon for MVS	MVS SP/1, SP/2	TSO, batch jobs, started tasks and hardware configuration	IBM CPU and compatibles capable of running MVS	Warns of hardware and software conditions threatening availability or resource levels, gives a real-time window into MVS, provides authorized users a set of action commands for correcting problems	No	NA	Yes	Yes	No	No	No	No	\$23,500-\$28,500
	Omegamon for CICS	MVS SP/1, SP/2	CICS	IBM CPU and compatibles capable of running MVS	Exception, bottleneck and impact analysis, exploratory and action commands	No	NA	Yes	Yes	No	No	No	No	\$23,500-\$25,500
	Omegamon for IMS	MVS SP/1, SP/2	IMS	IBM CPU and compatibles capable of running MVS	Warns about hardware and software conditions threatening IMS service, provides a real-time window for observing factors affecting IMS service, gives authorized users a set of action commands for correcting problems	No	NA	Yes	Yes	No	No	No	No	\$19,500-\$24,500
	Omegamon for VM	VM/SP, VM/HPO, VM/XA	VM/SP, VM/HPO, VM/XA	IBM CPU and compatibles capable of running VM	Warns about hardware and software conditions threatening service to VM or its guest operating systems, provides a real-time window for observing factors affecting service, provides authorized users a set of action commands for correcting problems	No	NA	Yes	Yes	No	No	No	No	\$7,500-\$17,500
Carolian Systems International, Inc. (416) 673-0400	Sysview	MPE	Resource usage (CPU, disk, memory)	HP 3000	Global and process level information, response time figures by process, reporting of abnormal situations, freezes time to view all aspects of the system, interactive batch and logging options	Yes	Text reports based on user-defined parameters	No	Yes	Yes	Sysplan	No	Any ASCII files	\$4,000
	Sysplan	MPE	Resource usage (CPU, disk, memory, printers, tape)	HP 3000	Accurate global and process-level data collection, user control in reporting, flexible reporting, low overhead during data collection, trend graphs for planning future hardware configurations	Yes	Numerical, graphics	Yes	Yes	Yes	NA	No	Any ASCII files	\$8,000

## CAPACITY PLANNING/PERFORMANCE MONITORING SOFTWARE

## SPOTLIGHT

COMPANY	PRODUCTS	OPERATING SYSTEM	ENVIRONMENT MEASURED	HARDWARE REQUIRED	MAJOR FUNCTIONS	INCLUDES REPORT GENERATOR	TYPES OF REPORTS PRODUCED	GRAPHICS ANALYSIS OF DATA	ON-LINE, REAL-TIME REPORTING	DATA ARCHIVING	CAPACITY PLANNING AIDS	MODELING FEATURES INCLUDED	INTERFACES	PRICE
Chicago Soft Ltd. (312) 525-6400	The Boundary Alert System	MVS, MVS/XA	SNA networks	IBM 4300, 3080, 3090	Measures availability and outages of network resources, shows chronic error conditions that are self-recovering	Yes	Management, exception	Yes	Yes	Yes	Yes	No	MICS, MXG, IBM network logs	\$9,500
	Pool Monitoring Facility	MVS, MVS/XA	Static capacity utilization of DASD devices	IBM 4300, 3080, 3090	Monitors amount of space allocated on each group of volumes designated as storage pools, sends message to a TSO user if user-specified threshold is exceeded	Yes	Pool utilization reports, capacity planning reports	Yes	Yes	Yes	Yes	No	MICS, MXG	\$6,200
Computer Associates, Inc. (219) 232-7921	Mazdamon	MVS	Networks	IBM mainframe	Processes data and generates reports, on-line reporting	Yes	More than 200 reports	Yes	Yes	Yes	No	No	No	Contact vendor
Corporate Computer Systems, Inc. (201) 946-3800	Transparent Activity Sampling Program	RTE A, VI	Computer resource usage	HP 1000 RTE A, VI	Monitors resource usage, detects program and system bottlenecks, improves individual program or overall system efficiency, evaluates current and future system capacities	Yes	—	No	Yes	No	No	No	No	Contact vendor
Daniel Computing Systems, Inc. (403) 273-2657	The Benchmark Monitor for RSK	RSX-11M/ Mplus	OS, applications programs	DEC PDP-11	Disk tuning, I/O breakdowns	No	NA	No	Yes	No	On-line reports	No	No	\$2,000
Database Utility Group Inc. (206) 878-1001	APAS/insight (Adabas Performance Analysis System)	MVS, MVS/XA, VS 1, DOS/VSE, DOS/SP, VM/CMS, BS 2000	Work done by Adabas	IBM 3070 and compatibles	Generates detail, summary information as copy reports or data files directly from Adabas or files of command log records, selective logging of command data, performance history system, flexible request syntax	Yes	Summary (command type, user ID, etc.), descending sort sequence, graph formats, on-line snapshots of Adabas nucleus performance levels	Yes	Yes	Yes	Included in history system	No	Any other reporting or analysis software	\$15,000 (with insight)
	Spaceman	MVS, MVS/XA, VS 1	Adabas physical I/O	IBM 3070 and compatibles	Samples Adabas physical I/O, attributes I/O to detailed data base components, analyzes I/O usage to calculate optimum data base organization, analyzes each data base file to identify inherent performance problems	Yes	Static, summary and detail reports	Yes	Yes	Yes	Spaceman directory and history file	No	No	\$9,750
Datacomm Management Sciences, Inc. (203) 838-7183	NSM-64	PC-DOS	Network performance utilization and availability	IBM PC AT and compatibles, line-access module required (proprietary)	Real-time problem identification and isolation, cost allocation, network optimization and planning, management of service-level agreements	Yes	Group performance, line analysis, control unit, device transaction-level and real-time alarm reports	Yes	Yes	Yes	Utilization, trend analysis reports	No	Any PC-DOS based software (Base III, 1-2-3)	\$2,500 (software), \$1,000 (module)
	NSM-1000	RSK	Network control, management and planning	DEC PDP 11-73, line access module required (proprietary)	Real-time problem identification and isolation, cost allocation, network optimization and planning, management of service-level agreements	Yes	Network control, management and planning reports	Yes	Yes	Yes	Utilization, response time distribution and application utilization reports	No	No	\$15,000 (software), \$1,000 (module)
Datamax Computer Systems, Inc. (805) 945-6657	Virgo	MPX	Disk I/O, system service calls, CPU usage, general I/O	Gould computers (except Concept machines)	System integration, troubleshooting, spare capacity measurement, task performance analysis	Yes	Time-based graphs, detail event, disk usage histograms, file reference summaries, general performance summaries	Yes	No	Yes	No	No	No	\$7,500-\$8,500 per CPU depending on version
Datametrics Systems Corp. (703) 425-1006	Torch/PMS	OS-1100	Master log file, Mapper log, I/O trace	Unisys 1100/60, 1100/70, 1100/80, 1100/90	Measures system utilization, analyzes performance problems, work load trend analysis, capacity planning, justifies upgrades	Yes	Work load profiles, I/O reports, critical factors, management summaries, scatter plots	Yes	Yes	Yes	Produces inputs to computer modeling packages, allows user to define generalized work load classes	No	Capacity/C (proprietary), MVAP, Best/1	\$7,470-\$14,940 (per module)
Davis, Thomas & Associates, Inc. (800) 521-6773	DTA/LMON	DOS/VSE	Organizes shared virtual area	IBM 4300, 9370	Decreases size of SVA, reduces I/O, reduces CPU time required to load phases, shortens batch runtime, makes recommendations to improve performance	Yes	Analysis of phases loaded, analysis of existing SDL/SVA, overview of existing SDL/SVA, DTA/LMON recommendations report	No	No	No	No	No	No	\$1,260
DBMS, Inc. (312) 961-5700	Realtime Performance Monitor	OS	IDMS systems monitor	IBM mainframe	Determines bottlenecks within IDMS systems, performs wait-time analysis	No	NA	No	Yes	NA	No	No	No	\$29,900
Digilog (215) 638-4530	Digilog Protocol Analyzer Family	Proprietary	SDLCSNA, HDLC/J.25, 3270 bisynchronous	Digilog protocol analyzer (required to run the system)	Measures line utilization, response time, frame-level statistics, average message and packet length, protocol efficiency	No	NA	Yes	Yes	Yes	Statistical and performance information presented	No	No	\$300 (per protocol), \$1,400-\$22,000 (for analyzers)
Digital Equipment Corp. (617) 897-5111	VAX PCA	VMS	How well an application is running	DEC VAX	Evaluates performance of applications execution	Yes	Histograms, tables, lists	Yes	No	Yes	NA	NA	Proprietary	\$1,050-\$25,200 (depending on hardware)
	VAX SPM	VMS	System resource utilization	DEC VAX (except Microvax 1)	System tuning, capacity planning	Yes	Video displays, tabular reports, printed graphs, resource statistics reports	Yes	Yes	Yes	Through utilization analysis, trends	No	Proprietary	\$900-\$18,000 (depending on hardware)

## CAPACITY PLANNING/PERFORMANCE MONITORING SOFTWARE

## S P O T L I G H T

COMPANY	PRODUCTS	OPERATING SYSTEM	ENVIRONMENT MEASURED	HARDWARE REQUIRED	MAJOR FUNCTIONS	INCLUDES REPORT GENERATOR	TYPES OF REPORTS PRODUCED	GRAPHICS ANALYSIS OF DATA	ON-LINE, REAL-TIME REPORTING	DATA ARCHIVING	CAPACITY PLANNING AIDS	MODELING FEATURES INCLUDED	INTERFACES	PRICE
Duquesne Systems, Inc. (412) 323-2600	Netspy	MVS, MVS/XA	Network performance	IBM mainframe and compatibles	Reports on end-to-end user response time	Yes	Graphics, management, detail	Yes	Yes	Yes	Provides information for network capacity planners	No	MICS	\$15,000
	DASDMON	MVS, MVS/XA	DASD performance	IBM mainframe and compatibles	Monitors performance of DASD I/O subsystem	Yes	SAS, graphics, management, detail	Yes	Yes	Yes	No	Yes	No	\$15,000
	QCM	MVS, MVS/XA	MVS mainframes	IBM mainframe and compatibles	Total CPU and I/O measurements	Yes	SAS, graphics, management, detail	Yes	Yes	Yes	Creates information necessary for capacity planners on mainframes	No	No	Starts at \$14,000
	Program Management Optimizer	MVS, MVS/XA	Partitioned data set directory activity	IBM mainframe and compatibles	Monitors and eliminates DASD I/O to partitioned data set directories (PDS directory I/O)	Yes	On-line, batch, detail activity	No	Yes	No	No	No	No	Starts at \$7,500
	Quickfetch	MVS, MVS/XA	Program fetch activity	IBM mainframe and compatibles	Monitors and eliminates program fetch I/O	Yes	On-line, batch, detail activity	No	Yes	No	No	No	No	\$14,000
EEC Systems, Inc. (617) 443-5106	Turbodisk	VMS	I/O performance	DEC VAX	Analyzes file system and determines which files are most heavily used, off-loads heaviest I/O activity to main memory	Yes	I/O activity	No	Yes	NA	No	No	No	\$1,250-\$10,000 (depending on version)
	Turbodisk Plus	VMS	I/O performance	DEC Microvax II, QED1 (RAM required)	Analyzes file system and determines which files are most heavily used, off-loads heaviest I/O activity to main memory	Yes	I/O activity	No	Yes	NA	No	No	No	\$2,500
Gejac, Inc. (301) 725-2500	SRF Software Performance Monitor	RSX-11, M-Plus	System tasks and user activities	DEC PDP-11	Monitors system capacity, pinpoints I/O problems, analyzes task performance, identifies pool fragmentation and problems, eliminates device bottlenecks	Yes	Graphics, summary, detailed statistical and trend reports	Yes	Yes	Yes	Yes	No	SAS, Data-trieve	\$4,000-\$5,000
	ARSAP	VMS	Operating system, peripherals, users, projects, programs	DEC VAX, Vaxcluster, Microvax	Capacity management, trend analysis, performance evaluation, tuning and monitoring programs, resource management	Yes	On-line color graphics, data base historical reports, trend analysis, summary	Yes	Yes	Yes	On-line graphics, detail technology performance monitoring, summary reports	No	Data-trieve, Fortran, Cobol	\$5,000-\$13,000
Goal Systems International, Inc. (800) 443-4640	Explore/CICS	VSE, VSE/SP, CICS	CICS system activity for performance monitoring	IBM 370, 4300, 3080, 3090	CICS system status, threshold monitoring, degradation analysis, on-line reports and flashback facilities, batch interface	Yes	Histograms on long-term trends, tabular reports, plots and graphs in histogram format	Yes	Yes	Yes	No	No	Proprietary	Contact vendor
	Explore/VM	VM/SP, HPO	System activity, virtual machines	—	Exception monitoring and handling, automatic facility, virtual machine degradation and real device analysis	No	NA	Yes	Yes	Yes	No	No	NA	Contact vendor
	Explore/VSE	VSE/SP, DOS/VSE	System activity	IBM 370, 4300, 3080, 3090	Wait-state monitor, job execution monitor, loop detection, automatic command execution, system analysis	No	NA	Yes	Yes	Yes	No	No	Proprietary	Contact vendor
Honeywell Bull, Inc. (617) 895-6000	Basic System Indicator	GCOS 7	Work load and resources of GCOS 7 installation	DPS 7, DPS 7000 installations	Analysis of system configuration, CPU and I/O activity, virtual memory manager, memory usage, transaction processing and interactive time-sharing applications response times, disk subsystems	Yes	Graphs, histograms, tabulations, statistics varied by parameter	Yes	Yes	Yes	No	—	Proprietary	Contact vendor
	System Behavior Reporter	GCOS 7	Work load and usage of GCOS installation; users can choose analysis on all measurable aspects of system activity	DPS 7, DPS 7000 installations	Analysis of CPU and I/O activity, virtual memory manager load and usage, response time for all communications jobs, real-time activity, missing segment and page processing, software configuration tables	Yes	CPU activity per processor, service time per system process, activity of specific disk including service time, queue length and seek length	Yes	Yes	Yes	Yes	—	—	Contact vendor
	Statistical Instrumentation Facility 8	GCOS 8	Total systems	GCOS hardware platform	Performance data manager, GCOS 8 service that provides various instrumentation points, allows user to write monitors and capacity planners without knowledge of internal table structures	No	NA	No	No	No	No	No	Proprietary	Contact vendor
	Transaction Processing Monitor	GCOS 8	Transaction processing production	VIP series terminals, IBM PC and compatibles, Macintosh, terminal emulation software	Utilization, on-line transaction statistics	No	NA	No	Yes	Yes	No	No	No	Contact vendor
	System Trace and Event Monitor	GCOS 8	Disk I/O performance	GCOS 8 hardware platform	Contention queuing and utilization analysis, I/O categorization	Yes	Summary and detail reports of previous functions	No	No	No	Yes	No	No	Contact vendor
	Personal Support Environment 8	GCOS 8	GCOS, software	VIP series terminals, IBM PC and compatibles, Macintosh, terminal emulation software	Interactive monitors for displaying system tuning parameters	No	NA	No	Yes	No	Dispatchers, queue changer	No	No	Contact vendor



## CAPACITY PLANNING/PERFORMANCE MONITORING SOFTWARE

## SPOTLIGHT

COMPANY	PRODUCTS	OPERATING SYSTEM	ENVIRONMENT MEASURED	HARDWARE REQUIRED	MAJOR FUNCTIONS	INCLUDES REPORT GENERATOR	TYPES OF REPORTS PRODUCED	GRAPHICS ANALYSIS OF DATA	ON-LINE REAL-TIME REPORTING	DATA ARCHIVING	CAPACITY PLANNING AIDS	MODELING FEATURES INCLUDED	INTERFACES	PRICE
Honeywell Bull, Inc. (617) 895-6000	Performance Utilization System Monitor	GCOS 8	Total system	VIP series terminals, IBM PC and compatibles, Macintosh, terminal emulation software	Real-time analysis, graphics, color, threshold analysis, menu-driven	No	NA	Yes	Yes	No	No	No	No	Contact vendor
	Performance Analysis Reporting System 8	GCOS 8	Total system	GCOS 8 hardware platforms	Trending, data archiving and retrieval, threshold and work group system analysis	Yes	System, trending, summary, exception reports	Yes	No	Yes	No	No	Proprietary	Contact vendor
	DPS 6 System Monitor	GCOS 6, MOD 400	CPU utilization, effectiveness of disk caching	DPS 6 models	Monitors CPU utilization, CPU/disk overlap, operating system ring usage, priority level usage, I/O ratios, number of I/Os, I/O length, correctable I/O errors, simulates disk caching, provides projected performance data	Yes	Summary and detail system utilization, detail disk utilization, detail CPU utilization	No	Yes	Yes	No	—	No	Contact vendor
	Cache Statistics Display	HVS 6	Effectiveness of disk caching	DPS 6 Plus models	Calculates and displays read-to-hit ratio, read-to-I/O ratio, total I/O requests, average I/O lengths, I/O measures for disks cached in both sequential and random mode, calculates number of file system requests, page requests and physical I/O requests	No	NA	No	Yes	Yes	No	—	No	Contact vendor
	Video	GCOS 6, MOD 400	System resource usage	DPS 6, DPS 6 Plus models	Displays user resource statistics, device status, sensory usage	Yes	Communications, channel statistics, summary and station statistics report	No	Yes	Yes	No	—	No	Contact vendor
	Communications Status and Statistics Utilities	GCOS 6, MOD 400	Communications subsystem	DPS 6, DPS 6 Plus models	Displays number of I/O requests for all or some channels, number of processor interrupts, usage of communications subsystem elements	Yes	Communications statistics summary, channel statistics summary, station statistics	No	Yes	Yes	No	—	No	Contact vendor
Help/38 Systems, Inc. (612) 933-0609	Auto Tune	CPF	Amount of memory given to a task, jobs allowed to run in a given amount of memory	IBM System/38	Monitors activity on system every 10 seconds, adjusts memory pool size and activity level	Yes	System activity reports	No	Yes	Yes	No	No	No	\$1,750
Independent Computer Systems (602) 866-2600	Toolbox	MOD 400, GCOS 6, HVS	System resources	DPS 6 (all models)	Disk queue information, critical resource monitoring, buffer pool statistics	No	NA	No	Yes	Yes	No	No	No	\$4,400 (for the module)
IBM Contact local IBM sales office	CICS/SPAR/MVS	CICS, OS, VS	CICS, OS, VS	—	On-line performance monitoring capabilities, alert monitor, problem determination facilities, tutorial Help function	Yes	Analysis of CICS/OS/VS resource use and task activity, batch reporting	Yes	Yes	No	Exception summary and storage history reports	No	—	Contact vendor
Innovative Software, Inc. (800) GET-SMART	The Smart LAN Performance Test	MS-DOS, PC-DOS	PC LAN, NetWare operating systems	IBM PC and compatibles	Allows user to compare performance of LAN systems in simulated working environment	Yes	Network configuration comparisons	Yes	No	Yes	No	No	No	\$49.95 (for software)
Interactive Solutions, Inc. (201) 488-3708	Acacia/OPM	MS-DOS, PC-DOS	End-user response time	IBM PC, XT, AT and Ima board, IBM 3274 controller	Measures end-user response time in IBM mainframe environment by transaction types and groups	Yes	Response-time distribution by transaction, percent of total transaction, average response time in seconds, distribution reports	No	Yes	Yes	Yes	Yes	SAS, 1-2-3, others	\$1,995 and up
Jason Data Services, Inc. (714) 770-7789	Comman	DOS/VSE, DOS/SP2	Operating activities, console management	Hardware running DOS/VSE, DOS/VSE-SP2	Transaction capabilities, time and date stamps activity, supports more than 100 programmable functions	No	NA	No	Yes	Yes	—	No	Most	\$7,500
Kisco Information Systems (914) 241-7233	F1 Manager	SSP	Disk performance	IBM System/36	Disk space maps, disk allocations by department, managed disk backups	No	NA	No	No	Yes	Yes	No	No	\$250
Landmark Systems Corp. (800) 227-8911	The Monitor for CICS	VSE/MVS	CICS	IBM mainframe	Application tuning and debugging, performance monitoring response times, transaction monitoring, data management and batch reporting, file activity monitoring	Yes	Transaction and file performance summary, cost summary by account, customized reports	Yes	Yes	Yes	Yes	—	DL/I, Adabas, I-deal, Macis, MICS, Millennium	\$8,000 (VSE), \$21,000 (MVS)
MacKinney Systems (417) 882-8012	Peek CSA	All versions of IBM DOS/VSE, OS	CICS	IBM CPU and compatibles running DOS/VSE, VSE 2.1	File and local shared-resource statistics, CICS storage utilization statistics, CSA/TCT statistics, core display and modification, general system statistics	No	—	No	Yes	No	No	—	No	\$695
Macro Four, Inc. (800) 223-0414	VPAC	VM (including IFO and EA)	Operating system	IBM 370, 3080, 3090, 4300, VM compatibles	DASD contention and seek analysis, detects bottlenecks, user resource control, user job analysis tool	Yes	Performance statistics vs. time, user-specified reports based on data dictionary	Yes	Yes	Yes	Yes	No	Yes	Contact vendor
	System Accounting	DOS/VSE	DOS/VSE, CICS (optional)	IBM 370, DOS/VSE and compatibles	DASD contention and seek analysis, detects bottlenecks, supports IBM Power accounting, user job analysis tool	Yes	Performance statistics vs. time, user-specified reports based on data dictionary	Yes	Yes	Yes	Yes	No	Yes	Contact vendor
Massaglia and Associates, Inc. (517) 332-4700	IBM System/38 Communication Line Monitor	NA	Communication lines connected to System/38	None	Responds to line failures, restarts device, logs status of lines, controllers and devices	Yes	Problem-specific, status and corrective action	Yes	No	No	No	No	System/38 CSNAP	\$295 (for one-time license fee)

## CAPACITY PLANNING/PERFORMANCE MONITORING SOFTWARE

## S P O T L I G H T

COMPANY	PRODUCTS	OPERATING SYSTEM	ENVIRONMENT MEASURED	HARDWARE REQUIRED	MAJOR FUNCTIONS	INCLUDES REPORT GENERATOR	TYPES OF REPORTS PRODUCED	GRAPHICS ANALYSIS OF DATA	ON-LINE, REAL-TIME REPORTING	DATA ARCHIVING	CAPACITY PLANNING AIDS	MODELING FEATURES INCLUDED	INTERFACES	PRICE
McCabe & Associates, Inc. (800) 638-6316	Analysis of Complexity Tool	VMS, Unix, MS-DOS	Complexity of application code	DEC VAX, IBM PC and compatibles	Complexity metrics, module test paths with test conditions, design structure and inferences	Yes	Flow charts, annotated source and test path listings, design structure	Yes	No	Yes	No	Yes	Yes	Contact vendor
M. L. Ellis & Associates, Inc. (512) 343-4517	OTAM-1100	Series 100 Executive System	Operating system	Unisys 1100	Allows system tuning for better efficiency, monitors performance and effects of new applications, allows monitoring of data base work loads, takes user-specified alert action when user thresholds are exceeded	Yes	System statistics vs. time	Yes	Yes	Yes	No	No	No	Contact vendor
Merino Associates, Inc. (703) 734-9494	TSM/MON	MVS, MVS/XA	Use and performance of TSO, including TSO sessions under ISPF/PDF	IBM 370, 4300, 3080, 3090 and compatibles	Measures response time for TSO systems and consumption of resources by system, user, program, command and CLISTS; maintains historical file of TSO use/performance; provides analysis of use and performance of data base applications and fourth-generation language	No	Detail tracking, audit, management summary, color graphics	Yes	Yes	Yes	Yes	No	T/M on-line, MICS TSO component	\$26,000 (initial-year license fee)
	MICS Capacity Planning Component	MVS, MVS/XA	Work load else and resource consumption, estimates future demand in an MVS or MVS/XA environment	IBM 370, 4300, 3080, 3090 and compatibles	Integrated methodology and tools needed to implement effective capacity planning programs, work load characterization and forecasting, reporting	Yes	Work load characterization, work load forecasting, presentation graphics, business element forecasting	Yes	No	Yes	Yes	No	With each MICS component, uses MICS data base files as input	\$8,000 (initial-year license fee)
	MICS Performance Management Component	MVS, MVS/XA	System performance, changes in performance over time	IBM 370, 4300, 3080, 3090 and compatibles	Batch work load analysis, MVS systems tuning, I/O configuration analysis, monitors and tracks existing performance and changes in performance over time	Yes	Work load characterization, IPS analysis, real storage analysis, auxiliary storage analysis, I/O analysis including shared DASD	Yes	No	Yes	Yes	No	With each MICS component, uses MICS data base files as input	\$8,000 (initial-year license fee)
NCR Comten (612) 638-7944	Comten Communication Alerting Facility	COS (proprietary)	Provides real-time status and configuration information on communications lines terminated by NCR Comten communication processors	NCR Comten communications processor, Comten T-4050 or T-4017	Provides real-time status and configuration information for all communications lines attached to NCR Comten communications processor; alerts users when monitored communications line does not meet performance thresholds and parameters	No	NA	No	Yes	No	No	No	No	\$902-\$2,706 annual license fee
	Comten Overview	MS-DOS, PC-DOS	Monitors incoming information such as trunk and X.25 statistics and system performance from NCR Comten communications processors	PC-based Comten T-4062 console or specific configurations of compatible PCs, NCR Comten communications processor	Monitors incoming information, allows users to build and store command lists, initiates predefined command lists in response to a user-defined event, notifies operators of critical network problems, assists operators through menu-driven command mode	Yes	Dependent on external report generator	Yes	Yes	Yes	Output files can be used with external capacity-planning aids	Yes	Any ASCII files	\$2,200 annual license fee
Northwest Digital Software, Inc. (509) 447-5631	RPM RSTS Performance Monitor	RSTS	RSTS operating system	DEC PDP-11	Uses AI algorithms to suggest performance enhancements, identifies performance bottlenecks on system-application and file level	Yes	User-defined, plots, histograms, correlations	Yes	Yes	Yes	English-language summary of resource availability	Yes	No	\$1,750 (one-year license fee)
Operations Control Systems, Inc. (415) 493-4122	OCS Scheduler, Dispatcher, Network, Librarian	MPE (all versions)	Production software task activity	HP 3000 series	Detects bottlenecks, schedules production, work load balancing	Yes	User-specified reports, command set, performance statistics vs. time, logs production activity	No	Yes	Yes	Protects production work loads	No	Most HP application software	\$2,500-\$15,000
Para Research, Inc. (617) 283-3438	Time Tracker	IBM SSP	CPU time/job, device utilization	IBM System/36	Achieves maximum response time, allows tuning of task scheduling, records usage and cost by department workstations	Yes	CPU time graphs and reports, cost/device utilization vs. time reports for departments and workstations	Yes	Yes	Yes	Yes	No	No	\$750
Peregrine Systems, Inc. (714) 855-3923	PNMS III	MVS, Unix	All data center operations	IBM 3070, 3080, 3090, 4300 series and compatibles	Problem tracking, change management, inventory control and management, financial management	Yes	Availability and budget forecast reports	No	Yes	No	Problem management reports, resource evaluations, budget forecasts	Yes	—	Contact vendor
Performance Systems, Inc. (301) 783-0300	SCERT II	MVS, VM	Overall system performance	IBM mainframe, IBM PC AT and compatibles	Modeling capability, predicts performance	No	NA	Yes	Yes	Yes	Within program functions what-if modeling	Yes	RMF, SMP, MOX, SAS	\$66,000
Programart (617) 661-3020	Strobe	MVS	On-line and batch applications	IBM mainframe and compatibles	Reports on transaction usage by control section, DASD usage by cylinder, program usage by procedure, CPU and I/O usage	Yes	NA	Yes	Yes	Yes	No	No	Computer Associates Optimizer/Indexer	\$35,000-\$50,000
Renzo Rabbit Software, Inc. (301) 338-3630	Rabbit Z	VAX/VMS	Monitors resources and security	DEC VAX running VMS	Provides graphics analysis of VMS resource consumption, security analysis and monitoring, resource analysis by accounts	Yes	Graphics reports	Yes	Yes	No	Based on performance analysis	NA	No	\$900-\$13,000
Rimaco Software, Inc. (713) 946-0724	Facilities Administration Assistance Package	VOS	All hardware and software usage	Any Harris H series H100-H1500	Storage distribution, security, resource usage	Yes	Storage distribution, resource utilization, operating system activity	Yes	Yes	Yes	Storage distribution by user	NA	No	\$4,600

## CAPACITY PLANNING/PERFORMANCE MONITORING SOFTWARE

## S P O T L I G H T

COMPANY	PRODUCTS	OPERATING SYSTEM	ENVIRONMENT MEASURED	HARDWARE REQUIRED	MAJOR FUNCTIONS	INCLUDES REPORT GENERATOR	TYPES OF REPORTS PRODUCED	GRAPHICS ANALYSIS OF DATA	ON-LINE, REAL-TIME REPORTING	DATA ARCHIVING	CAPACITY PLANNING AIDS	MODELING FEATURES INCLUDED	INTERFACES	PRICE
Scientific Business Systems, Inc. (212) 481-1310	Vomad	DOS/VSE	VSAM	Any IBM mainframe running DOS/VSE	Monitoring and tuning VSAM clusters	No	NA	No	Yes	No	No	No	No	\$2,600
Simware, Inc. (613) 727-1779	SIM/Config	MS-DOS, PC-DOS	Hardware device inventory, connectivity	Hardware with graphics card and color monitor	Hardware configuration and connectivity management	Yes	Configuration diagrams, circuit, cable, DASD hardware device reports	No	No	Yes	Allows illustrative analysis of future configurations	NA	Info/Management	\$5,000 with site license
Softlight Corp. (803) 833-6127	Performance Analyst	SSP	Enhancement to system measurement facility	IBM System/36	Graphing and reporting SMF data	Yes	Summary and exception reports	Yes	No	Yes	History reporting	NA	IBM Query 36 and PC Support 36	\$199
Software Clearing House, Inc. (513) 451-6742	SAT	NCR VRX	System performance	NCR 8400, 8500, 8600, 8800, 9800	Job scheduling, predicts future hardware requirements, tracks overall operations, auditing, chargebacks and rate determinations	Yes	Audit and job statistics reports, device utilization, CPU job priority analysis, unsuccessful job determination	No	Yes	No	Idle time and activity analysis, usage graphs, monthly summary of trends	Yes	NA	Contact vendor
Software Diversified Services (a division of J. W. Lampi, Inc.) (612) 571-9000	Orca	DOS/VSE, VSE/SP	CICS, DOS/DL/1	IBM 4300 series, any IBM or plug compatible running DOS	Information on operation of CICS system	Yes	Historical data reports	No	No	No	No	No	No	\$2,600
Software Extraordinaire, Inc. (206) 282-9422	The Performance Analyzer	Wang VS	Wang systems, CPU utilization, disk I/O, memory utilization	Any Wang CPU running VS	Provides data for disk use optimization and tuning	No	NA	Yes	No	Yes	Main memory and disk utilization, actual usage vs. theoretical capacity	No	No	\$2,500
Software Techniques, Inc. (714) 895-1633	ACT/Project	VAX/VMS	Usage accounting	Any DEC VAX	Centralized data bases shared across a network, add and delete functions, user-definable chargeback codes	Yes	User, account, division	No	Yes	No	Yes	NA	RMS and compatibles	Contact vendor
Star, Inc. (800) 258-STAR	VSUM	MVS	VSAM	IBM mainframe	Performance and design tool; list, model and design functions; analyzes recommendations	Yes	All catalog, tuning and design information, space utilization	Yes	Yes	Yes	Analysis, ability to interrogate VSAM files	Yes	No	\$4,200 single CPU
Sterling Software Marketing (a division of Sterling Software, Inc.) (916) 635-5535	Smart DASD	OS	DASD performance	IBM mainframe and plug compatibles	Contention analysis tool; monitors I/O activity, suggests data set placements, minimizes contention between volumes at string level, simulates environment before migration	Yes	Degradation and DASD subsystem analysis, DASD string contention, DASD space utilization	No	No	No	Through reporting functions	Yes	IBM GDQM, SAS	\$10,000 per site
Tandem Computers, Inc. (408) 725-6000	Measure	Guardian 90 (proprietary)	System performance	Any Tandem Nonstop VIX, TXP II, EXT-10, EXT-25, CLX systems	Allows continuous measurement, examines data, coordinates measurement functions, user and programmatic interfaces provided, no software program changes required	Yes	Status on all current measurements and counter records for entity types in one measurement, bar graphs comparing counter value for entity type, information on configuration being used for any given measurement	Yes	Yes	No	Yes	No	Proprietary	\$1,500-\$3,000 (initial license fee) \$100-\$200 (monthly license fee)
Technitronics, Inc. (703) 749-1471	Explicit	MVS-resident	Monitors VM or MVS mainframes, SNA networks	IBM mainframe or plug compatible, analytical/graphics on IBM PC AT, XT or PS/2	Performance management through interactive graphics; performance analyzer	Yes	Tabular, histogram, scatter diagrams	Yes	Yes	Yes	PC-based analytical models	NA	SAS	\$5,000-\$40,000
Telebyte Technology, Inc. (516) 423-3232	Netscope	NA	Data communications on RS-232 networks	RS-232 port	Monitors, emulates and tests RS-232 circuit	No	NA	Yes	Yes	No	Troubleshooting ability	No	NA	\$1,800
Telwatch (916) 355-8550	Netwatch	Unix, MS-DOS	Network voice and data circuits	NA	Checks for noise, poor transition level, out-of-service trunks	Yes	Traffic summaries, call duration, transmission parameters, peg count, bad-call percentage	No	Yes	Yes	Traffic summaries, group traffic and group-traffic-by-hour reports	No	Proprietary, IBM Netview	\$1,600-\$3,300 (depending on configuration)
	T1 Watch	Unix, MS-DOS	T1 circuits	NA	Monitors DS1 signal, DS0 trunks	Yes	Traffic, data traffic by hour, average call duration and level, noise and return loss per trunk	No	Yes	Yes	Traffic summaries, group traffic and group-traffic-by-hour reports	No	Proprietary	Contact vendor
	Datawatch	Unix, MS-DOS	Full duplex data circuits	NA	Identifies signaling and traffic problems and circuits with low receive level	Yes	Detailed traffic	No	Yes	Yes	Traffic reports, eliminating over or under trunking	No	Proprietary	Contact vendor
	Net Exec	Unix, MS-DOS	Telecommunications networks	NA	Gathers, store and manipulates information collected from multiple Networks	Yes	Consolidated management, customized, exception	No	No	Yes	Trunk traffic report	No	Proprietary	\$3,000
	Net Exec 2000	Unix	Telecommunications networks	Unix processors	Monitors transmission equipment and circuits for failures; centralized collection of failure information, analyzes cause of network trouble, generates temporary work-around, tracks from problem identification to resolution	Yes	List of alarms, trouble ticket reports	No	Yes	yes	No	No	Proprietary	Contact vendor

COMPANY	PRODUCTS	OPERATING SYSTEM	ENVIRONMENT MEASURED	HARDWARE REQUIRED	MAJOR FUNCTIONS	INCLUDES REPORT GENERATOR	TYPES OF REPORTS PRODUCED	GRAPHICS ANALYSIS OF DATA	ON-LINE, REAL-TIME REPORTING	DATA ARCHIVING	CAPACITY PLANNING AIDS	MODELING FEATURES INCLUDED	INTERFACES	PRICE
Telwatch (916) 355-8550	Net Optimizer	MS-DOS	Telecommunications networks	IBM PC and compatibles	Network design and engineering tool; collects, analyzes and reduces traffic data for engineering calculation; supports engineering of long-distance services by trunking, costing and optimizing the network to meet grade-of-service requirements	Yes	Prints all screens, traffic summary and engineering reports	No	No	Yes	Yes	Yes	Telwatch Call Accounting Software	Contact vendor
Unisys Corp. (215) 542-4187	Performance Display System	OS-1100	Operating system	PC connected to mainframes	Collects, organizes and displays information collected by five system logs; includes communications activity	No	NA	Yes	Yes	Yes	No	No	SIP, I/O Trace, System Log, Mapper Log, Telcon Log	Contact vendor
VM/CMS Unlimited, Inc. (617) 288-4434	CMS Command Monitor/Analysis Package	VM/SP, VM/HPO	CMS command use	Any IVM or plug-compatible running VM	Performance and user-behavior analysis; provides management information on critical users, applications	Yes	Raw data, command and user summary, command and user detail	Yes	Via SAS interface	Yes	Analyses trends to prepare for growth	No	CMAP/ Focus (Information Builders)	Contact vendor
VM Software, Inc. (703) 264-8000	VM Monitor	VM, VSE guests	Data on system, user and I/O subsystem performance	IBM mainframe and plug-compatible	On-line, real-time and automated monitoring; tuning; capacity planning; diagnostic and benchmark capabilities; analysis	Yes	User resource, device and CPU utilization statistics, DASD I/O and minidisk histogram usage	Yes	Yes	Yes	Yes	No	Proprietary	\$9,000 (Group 10 and 20 machines), \$13,500 (Group 30 and 40 machines)
Wang Laboratories, Inc. (617) 459-5000	VSAM III	VS	VS system performance	NA	Monitors CPU, I/O and memory usage interactively; stores results later analysis; reduces stored data for report use; plays back reduced data on interactive screens	Yes	Memory status, tape statistics, disk utilization, systemwide composite	No	Yes	Yes	No	NA	NA	Contact vendor

## WHAT ZEKE DOES FOR AUTOMATED SCHEDULING...

When Zeke, the scheduler that works, was released in 1982, it revolutionized automated job scheduling. And today, it's still the best scheduler on the market—better than CA-Scheduler, UCC-7, or any other.

Zeke is designed for today's data centers, not yesterday's batch environments. Only Zeke can open and close online files. Automatically reply to job messages. And bring the online system up and down.

With Zeke, installation takes hours instead of days. Implementation takes days instead of months. Whether you're running MVS, VSE, or both.

And there's another important difference: Zeke costs less. Less to buy, less to implement.

For a free copy of Datapro's independent analysis of job scheduling software, call Altai Software today.

You'll find out how Zeke revolutionized automated job scheduling—and how it can do the same for your data center.

**ZEKE**  
The scheduler that works.

## ZACK WILL DO FOR AUTOMATED OPERATIONS.

Introducing Zack, the operator's operator—a revolution—any new product from Altai Software.

Zeke lets you literally program your computer for unattended operations.

Other products may duplicate a few of Zack's capabilities—but none come close to matching Zack's outstanding features and exceptional flexibility.

Zack not only suppresses and responds to messages. Zack also lets you issue system commands. Write your own operator commands. Schedule commands by time of day. And more. Which means greater productivity for any MVS or VSE system.

Working alone, Zack can achieve dramatic results for your data center. And for even greater benefits, you can use Zack side-by-side with Zeke, the scheduler that works.

Call Altai Software today. And see how the operator's operator can automate your operations.

**ZACK**  
The operator's operator.



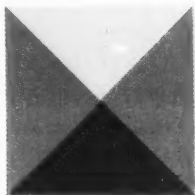
Software that works.

ALTAI Software • 624 Six Flags Drive • Suite 150 • Arlington, Texas 76011  
1-800-227-7774 (answered 24 hours a day)



# I/S Management

---



## Integrated

- Accounting and Chargeback
- Network Management
- Capacity Management
- Management Reporting
- Storage Management
- Operating Systems Management
- Online Systems Management
- Time Sharing Management
- Systems Software Management

For more information,  
call Chris Swanson at (703) 734-9494.



**M O R I N O                      A S S O C I A T E S**

---

*Specialists in I/S Management  
Data center, network, and applications management*

---

8615 Westwood Center Drive • Vienna, VA 22180-2215 • U.S.A. • Other offices in London, Dusseldorf, Paris, Stockholm, Antwerp

# Find Program Errors Fast

■ If you didn't spot our error Compuware CICS dBUG-AID would. This versatile debugging and testing tool helps detect and isolate multiple program errors, logic errors, CICS transac-

tion abends, even CICS storage violations. Fast. Because with CICS dBUG-AID, programmers can interactively view text one line of code at a time. And, its unique three-tier design enables the new

user, as well as the more experienced programmer and systems programmer, to put CICS dBUG-AID to work immediately. With CICS dBUG-AID you can't go wrong. To find out more about

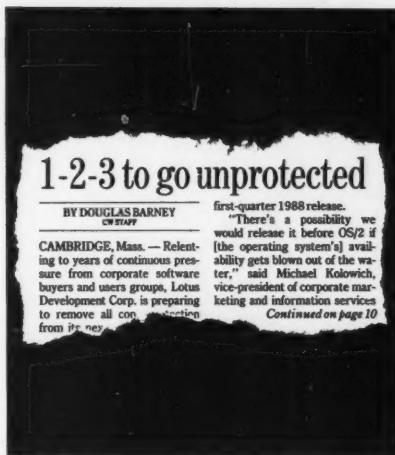
CICS dBUG-AID, CICS Abend-AID, and Compuware CICS PLAYBACK, write or call us at: 32100 Telegraph Road, Birmingham, MI 48010, 1-800-521-9353. In Michigan, (313) 540-0400.



**COMPUWARE**  
*Because experience is everything.*

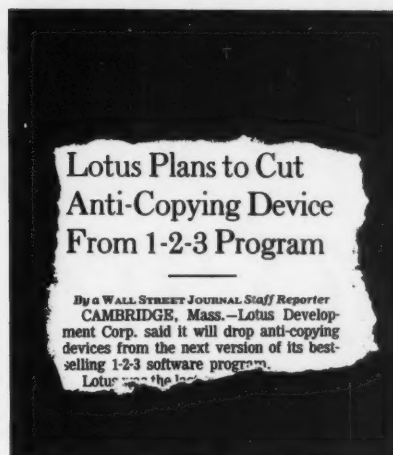
# **Computerworld First with the news that's important to you.**

## **Computerworld:**



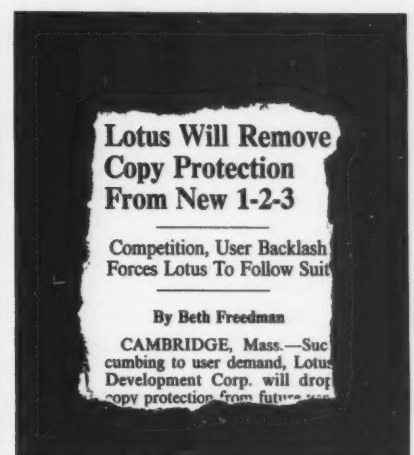
**September 14, 1987**

## **Wall Street Journal:**



**September 16, 1987**

## **PC Week:**



**September 22, 1987**

***Because you can't wait.***

**COMPUTERWORLD**

An IDG Communications Publication

We've  
just taken  
true super-  
computing  
to an  
unheard-of  
level.

---



# Departmental.

Thanks to ETA Systems, Control Data's supercomputer company, we've created the first true supercomputer a department can afford. We call it the ETA10-P.

## THE P STANDS FOR PERFORMANCE. ULTRA PERFORMANCE.

The ETA10-P offers a processing speed of 375 megaflops. That's as fast as the first generation Class VI machines. That's 30 times faster than a well-known, similarly configured mini-super. And over 100 times faster than today's most popular super-mini.

Yet an ETA10-P CPU is priced at an incredibly low \$850,000.

And a fully operational ETA10-P, including a CPU, disk, IOUs and software, is only \$995,000.

You get a true supercomputer that's faster than a CRAY-2 CPU (based on Linpack 100x100, all FORTRAN) for under a million dollars.

You also get a supercomputer so compact it slips through a 30" doorway and right into your department.

It installs in two hours and offers you low energy consumption and low maintenance costs. Because it's air-cooled.

## INTRODUCING THE ETA10-P SUPER- COMPUTER.

## AWESOME PERFORMANCE AT AN AFFORDABLE PRICE.



**ETA SYSTEMS**  
A Control Data Company

## AND THE ETA10-P IS JUST THE BEGINNING.

Because the ETA10-Q, an air-cooled supercomputer that's even faster than the P model, is also being announced.

Together with the present ETA10 machines—the liquid nitrogen cooled ETA10-E and the fastest supercomputer in the

world, the ETA10-G—the new P and Q models help create the only complete line of supercomputers in the industry.

Each model is available with single or multiple processors. In fact, there are 44 different configurations.

The result is a continuous family of processors with an unprecedented 27 to 1 performance ratio—that's the largest operating range in the business.

Each model also offers you an exceptional price/performance ratio.

And because they all share the same operating system, they provide you with what you need most:

## A COMPLETELY COMPATIBLE GROWTH PATH TO TOMORROW.

Call your local Control Data sales office for complete information on the ETA10-P and the ETA10 family. Or call Hal Julsen, Vice President of Sales, at 800-553-2214. Or write him at ETA Systems, Incorporated, 1450 Energy Park Drive, St. Paul, MN 55108.

We've just taken true supercomputing to an unheard-of level. And we want you to hear all about it.

**CD CONTROL DATA**

CRAY-2 is a trademark of Cray Research, Incorporated.  
ETA and ETA10 are trademarks of ETA Systems, Incorporated.  
7055 Copyright © 1987 Control Data Corp.

# COMPUTER CAREERS

## Airline industry flying high

*Business skills, DP acumen present attractive package to travel firms*

BY PATRICIA TAYLOR  
SPECIAL TO CW



Mergers, acquisitions and recent growth patterns within the travel industry are forcing the major airlines to either expand their MIS departments to meet the new demands or to begin looking to outside providers for support of their computing needs. Both scenarios bode well for experienced computer professionals.

For example, Northwest Airlines is currently looking to add MIS personnel, according to Lauren Dillard, director of MIS. Northwest is seeking talented professionals in the following four major applications development areas: maintenance and engineering, which includes flight crew management, scheduling and repair; on-line applications for reservations and weather information; finance, which handles accounting, passenger revenue and payroll; and management information systems, which includes support for the marketing department, frequent-flyer program, word processing and office automation.

Several other airlines are rethinking their internal commitments to the support of large

MIS departments.

Continental Airlines and Eastern Airlines now support their information systems needs through a separate spin-off company with offices in Miami, Los Angeles and Houston. This division actively recruits at major colleges and universities for entry-level MIS positions.

These airlines are in need of well-rounded applicants who possess programming expertise and managerial skills. "After all, we are in the customer service business," one director of computer services says. "Our employees must have both technical and interpersonal skills."

Competition ranks high on the list as a driving force behind this growth and expansion. Each airline must compete on several fronts: scheduling, pricing, customer service, safety and marketing. The support system for each of these functions requires some facet of information systems.

Michelle Brown, staffing representative at Northwest, notes that since the merger of Northwest with Republic Airlines, both information systems departments need to expand and grow to meet the combined needs of the newly enlarged organization. "We must beat or match the competition's capabilities," she says.

As a result of the merger and an upcoming conversion from a Sperry Corp. to an IBM environment, positions ranging from entry level to management are available in all four information systems areas.

The most sought-after tech-

nical applicants will possess qualifications in two distinct areas — a business related area such as finance or marketing and data processing systems or computer science.

The requirements for MIS professionals working at the airline's corporate headquarters differ from those for professionals working within the central MIS organization, which is often a separate area supporting customer services rather than cor-

porate MIS function.

Those in the airline industry perceive themselves as being on the leading edge of technology as users of a broad and varied range of applications. Applications including market research, finance, customer incentives and scheduling are only a sampling of the types of programs necessary to support such a diverse environment.

Employment opportunities are limited geographically by either a professional's choice to work at an airline's corporate headquarters or work within the central MIS environment. Corporate headquarters for major U.S. airlines are located in a number of cities, including Minneapolis, St. Louis, Miami, Dallas and Kansas City, Mo.

In general, where an airline actively recruits entry-level positions, recruitment is normally confined to the surrounding geographical area to curtail the phenomena of "training and then draining," where the new employee moves closer to home once he or she has acquired marketable skills and experience.

Unique to the airline industry is the offer of free travel as a benefit of employment.

One note of caution in this industry: Turnover rates tend to be very low. With the aforementioned growth trends, however, positions continue to become available at an increasing rate.

Taylor is an associate with the Center for the Study of Data Processing at Washington University in St. Louis.

**E**ACH AIRLINE must compete on several fronts: scheduling, pricing, customer service, safety and marketing. The support system for each of these functions requires some facet of information systems.

nical skills in the airline industry include knowledge of IBM assembler with demonstrated hands-on skill in writing code.

Airline Control Programming Language and Transaction Processing Function, a fast real-time programming environment specific to both the airline and banking industry, are also valuable skills.

A bachelor's degree in computer science with some business background will bring an entry-level employee at Eastern approximately \$2,000 per month in salary plus benefits and a company-sponsored extensive training program to look forward to.

In general, the most attrac-

porate functions.

Once again, both technical and managerial skills are highly valued. However, previous experience is often considered to be a must.

In general, corporate does not actively recruit for entry-level positions. Either employees are advanced from within or recruited for specific skills. Some of those skills include a working knowledge of fourth-generation languages, mainframe data base management and design and expertise in telecommunications.

These positions primarily support the internal business function, as opposed to customer service, which is in the realm of

## When You Absolutely, Positively Must Have An Exciting Career.

While we are a technology company, we are first and foremost a people company. The quality of service that has made us the leader in the field is attributable to the energy and skills of the men and women who explore new ways to apply technology to the solution of business communication problems.

### DATA BASE ADMINISTRATION

**Sr. DBA Analyst/DBA Analyst/Assoc. DBA Analyst**

You will design and install IMS Data Bases for Large Scale IBM Systems. All positions require experience in IMS DB/DC Data Base Administration. Experience preferred in: Monitoring data bases for performance; logical and physical data base design; data base reorganization and recovery procedures and utilities; and PSB and DBD creation. These positions require 1 to 7 years Data Processing experience with 1 to 3 years in Data Base Administration and 2 to 4 years in Systems Development.

All applicants for the above position should respond by forwarding resume indicating your experience and salary history in confidence to: **FEDERAL EXPRESS CORPORATION, P.O. Box 727, Dept. 8520, Memphis, Tennessee 38194, Attn.: Technical Recruiter/JG-1.**

Ours is a unique and creative environment for achievement. Technical resources are superior. Salaries are competitive. And our corporate benefit program is comprehensive. Join a team of dedicated professionals at Federal Express now!

**YOU DESERVE THE PLEASURE OF OUR COMPANY**



An Equal Opportunity Employer

### SOFTWARE PROFESSIONALS: PERHAPS YOU ARE LIKE US

You are one of those individuals who has paid your dues professionally. You are an above-average performer. Those around you know it, and you know it. You are ready for new challenges.

If that describes you, then we can probably make a great team -- because that also describes us. Let's talk. We offer above average salary and benefits to those who qualify.

Regardless of the particular skills in your background, please make contact our regional staffing managers. Here are some of our immediate needs (no entry level):

Collect calls will be accepted.

**LA/SO. CAL**  
14241 E. Firestone Blvd. #220  
La Mirada, CA 90638  
(714) 952-9119  
(213) 902-3262  
\* IDMS  
\* TMS-320  
\* PICK O/S  
\* ADA  
\* CICS/COBOL  
\* VAX/VMS sys. prog.  
\* ANIMATION/GRAPHICS

**NEW YORK REGION**  
675 3rd Ave., 28th floor  
New York, N.Y. 10017  
(212) 661-2801

**NEW JERSEY REGION**  
301 Route 17  
Rutherford, N.J. 07070  
(201) 939-3438  
\* IDMS/ADSO  
\* IMS DB/DC  
\* ADABAS/NATURAL  
\* CICS  
\* UNIX C

**SOUTH EASTERN STATES**  
1700 Alma Rd.  
Piano, TX 75075  
(214) 596-8200  
\* FOCUS  
\* IMS DB/DC  
\* CICS/DLI  
\* IDMS/ADSO  
\* DATACOM/IDEAL  
\* ACP/TPP

**MIDWESTERN STATES REGION**  
Damen Building  
200 W. Higgins Rd.  
Schaumburg, IL 60195  
(312) 882-5522  
\* CICS  
\* IMS DB/DC

**NATIONAL ACCOUNTS DIVISION**  
675 3rd Ave., 5th floor  
New York, N.Y. 10017  
(212) 667-0800  
\* SPERRY 1100 Series  
\* BURROUGHS B7800, B7900 A Series  
... Multiple Locations

**datronics**

# SOMETHING BIG IS HAPPENING DOWN UNDER

## IPARS/TPF is about to get interesting again

Qantas, Australia's international airline, is heavily involved in an exciting new development in reservations systems which is going to be big — very big.

We are therefore seeking the best IPARS/TPF people from around the world. No matter where you currently live and work, Qantas will make it worth your while to relocate to Sydney.

We are seeking skilled professionals with a minimum of 2 years IPARS/TPF experience in any of the following areas:

- **Project Leadership/Project Management**  
Experience in implementing large projects.
- **Applications Analysis & Programming**  
RES or DCS applications experience advantageous.
- **Systems Programming**  
TPF or ACP experience.
- **Data Communications Programming**  
TPF, SLC or SNA experience.
- **PC Systems Software Programming**  
C experience and operating systems exposure advantageous.

### PERMANENT OR TEMPORARY

Both permanent and temporary positions will be considered.

In either case we can offer you:

- **Generous Relocation Assistance**
- **Employer Nomination for Immigration Formalities**
- **Attractive Salaries.**

In addition to an outstanding lifestyle, you are guaranteed the opportunity to work with a dynamic team of professionals using the latest software tools and technology.

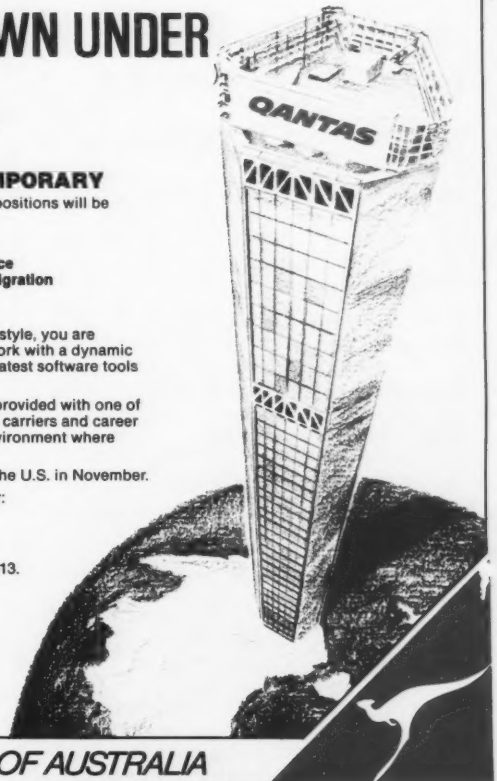
A range of attractive benefits is provided with one of the most respected international carriers and career prospects are excellent in an environment where promotion is based on merit.

Interviews will be conducted in the U.S. in November.

Please forward your CV to either:

Leslie Majus,  
DMR Group Inc.,  
801 North Brand Blvd,  
Glendale CA 91203. (818) 247 0613.

OR  
Jeni Harvey,  
DMR Group Inc.,  
57 River Street,  
Wellesley Hills, MA 02181.  
(617) 237 0087.



**QANTAS** THE SPIRIT OF AUSTRALIA

## SENIOR PROGRAMMER ANALYST

Colorado Springs, CO

Current, Inc., a leading national manufacturer of greeting cards and fine stationery items has an opening for a Senior Programmer Analyst. This position will develop, maintain and enhance the Manufacturing and Material Handling Systems in an MRP II environment.

The requirements for this position are:

- 4 year degree in IS, CS or equivalent experience
- 3-5 years structured COBOL
- 3-5 years Manufacturing Systems experience

Honeywell H6000, L66 or DPS 88 experience with exposure to DMIV/IDS II Transaction Processing and Fourth Generation Language is a plus.

Current, Inc. offers a competitive salary and compensation package in a creative and stimulating environment. Send a resume and salary history to: CURRENT, INC., Attention Nancy White, Dept. 54, P.O. Box 2559, Colorado Springs, CO 80901.

**CURRENT, INC.**



Equal Opportunity Employer

### ANALYSTS • PROGRAMMERS SOFTWARE/HARDWARE

#### Multiply your opportunities

With a network of over 1000 client companies and 200 affiliate employment agents nationwide, RSVP can selectively communicate your credentials to companies offering literally hundreds of choice, current career opportunities, clear across the nation.

#### We guide, you decide

Our no-obligation, no-pressure employment services to degreed, experienced U.S. citizens and permanent residents include resume development and interview arrangement.

If you qualify, call Howard Levin or Maureen McCue at 800-222-0153 or (in NJ) 609-667-4488, or send your resume to either address listed below. Our client companies pay all costs.

#### RSVP SERVICES

One Cherry Hill Mall, Suite 700,  
Dept. C • Cherry Hill, NJ 08002  
Dublin Hall, Suite 201, Dept. C  
1777 Walton Rd. • Blue Bell, PA 19422  
(mail address only)

Member Firm  
**computer/net**  
national placement network

RSVP SERVICES

## SALES

Our NATIONAL contract programming/consulting firm is searching for a DYNAMIC Sales Representative with a proven track record of direct "hands-on" sales experience of contract programming services.

The successful candidate will help us establish a marketing base in a large northeastern metropolitan area.

We offer significant compensation based upon direct sales, excellent fringe benefits, and relocation assistance as well as the OPPORTUNITY to achieve the position of Sales Manager in 1-2 years.

If you are up to the CHALLENGE, send your resume and compensation requirements to:

CW - 84876  
COMPUTERWORLD  
Box 9171  
Framingham, MA 01701 - 9171

### DATA PROCESSING OPPORTUNITIES

1-800-423-5383

We are national award winning DP specialists. Through our national association with NPA we have over 200 offices around the country ready to work for you! Some of our HUNDREDS of current needs include:

LIFE INSURANCE	To \$60K
SYSTEM/38	To \$40K+
HP3000	To \$40K
IDMS, IMS or ADABAS	To \$50K
P/A (COBOL or ALC)	To \$40K
CONSULTING	\$ OPEN
MVS or VM INTERNALS	\$ OPEN
ACF/VTAM/INCP	To \$50K
DATACOM/IDEAL	To \$50K+
DB2/SOL	To \$60K+
COBOL/CICS	To \$40K

ROBERT SHIELDS & ASSOCIATES  
P.O. Box 890723, Dept. C  
Houston, Texas 77289-0723

## NEW ENGLAND

### BOSTON

#### VM SYS. PROG.

Large SUBURBAN fin'l. svcs. firm seeks Sr. VM Sys. Prog. to install VM in DOS shop. This will allow migration to MVS/XA in 1988. Oppty. for hi-vis. leadership role in well known growing co. Salary to \$43,000.

### BOSTON

#### MVS TECH. SVC. MGR.

Internat'l. conglomerate seeks well founded tech. mgr. for expanding MIDWEST data center. Rptg. to VP MIS your responsibility will include (2) 43XX, OS/MVS, VM/CICS, IBM DB/DC w/both Voice & Data Comm. located at 2 major sites w/a staff of 8. Hi-vis. mgmt. assign. w/prestigious corp'l Salary to \$55,000.

### BOSTON

#### SYS-38 P/A's

Prominent fin'l. svc. firm seeks RPG-III developers for online DB apps. projs. This nat'l. firm offers a fast paced tech. environ. w/38's & mainframe exp. pot. + PC net integration. Unique tech. challenge & learning oppty! Salary to \$36,000.

### HARTFORD

#### MVS SYS. PROG.

Multiple oppty's. for indiv. with 3+ yrs. MVS sys. prog. exp. to join MVS/XA shop. These are long-term growth positions offering excellent benefits, bonuses & state-of-the-art environ. Salary to \$45,000.

### HARTFORD

#### TELECOMM. MGR.

CT oppty. for indiv. to direct expansion of lg. IBM network utilizing NCP/VTAM and multi-vendor remote processors. Strong people mgmt. skills req'd. for this highly visible position. Salary to \$50,000.

### HARTFORD

#### INS. CONSULT.

"Big 8" client seeks strong prop./casualty indiv. with excellent DP proj. mgmt. skills. Indiv. will build new client marketplace. Can travel from existing residence. Salary to \$100,000.

## ROBERT HALF

### DATA PROCESSING PERSONNEL SPECIALISTS

Contact the Manager of any office listed below.

100 Summer St., Boston, MA 02110

(617) 423-1200

111 Pearl St., Hartford, CT 06103

(203) 278-7170

Client Companies Assume All Fees.





# Now you can recruit the right people in the right places at the right price.

Let us introduce you to the IDG Communications Computer Careers Network. It's the new advertising service that lets you run the most targeted and cost-efficient recruitment program possible.

Its many options help you recruit qualified computer and communications professionals - regionally or nationally - with combination buys of up to eight leading newspapers. And all together, the Computer Careers Network delivers your message to an audience of well over 2 million qualified computer professionals.

**Look at what the Computer Careers Network lets you do:**

Customize your recruitment program. The Network's eight newspapers - *Computerworld*, *InfoWorld*, *Network World*, *Digital News*, *Federal Computer Week*, and *Computer Currents*/Northern California, Southern California, and Boston editions - let you tailor your recruitment program to your specific needs. You can buy the basic package of three - or as many as eight with add-on options. That way you can recruit from the combination of computer and communications professionals that's best for you.

Target your ad placement. You can place your advertising exactly where you want. If you wish to recruit within a specific area, you can advertise in the regional editions of the newspapers you choose - East, West, or Midwest. Or you can extend your reach by running in two regions - or even nationally. Plus - you can still take advantage of stand-alone national rates for individual newspapers.

Reach qualified professionals cost efficiently. Gone are the days when you have to worry about paying for waste circulation. The Computer Careers Network lets you buy the combination of newspapers that will deliver your recruitment message to qualified computer and communications professionals - and only those qualified professionals you need to reach.

To put the new Computer Careers Network to work for you - regionally or nationally - call the sales office nearest you, or contact **John Corrigan**, Recruitment Advertising Sales Director, at 617-879-0700 ext 676.

One quick phone call can give you all the information you need on running your recruitment advertising in up to eight leading industry newspapers. And if you hurry, you can still get in on the special low introductory offer!

## SENIOR PROJECT MANAGER

Senior Project Manager needed to develop, design, implement, and enhance the Bill of Lading software package that is used by oil distribution companies to track fuel purchases and sales. Develop, design, implement, and enhance the C-Store software package. This package is used by convenient stores for accounting, tax reporting, retail inventory tracking and the vital interface of cash receipts. Direct and perform the actual programming of Burroughs and NCR hardware. Manage project leaders and their respective staffs. Plan and formulate programs, as well as, assist project leaders in the organization of staff according to project requirements. Assign project personnel to specific phases or aspects of each project, such as, technical studies, product design, preparation of specification and technical plans, and product testing. Review products design for compliance with all principles, company standards, and customer contract specifications. Coordinate activities concerned with technical developments, scheduling, and resolving of all design and test problems. Direct the integration of technical activities and products. Evaluate and approve design changes and specifications. Requires a Masters Degree in Computer Science, Mathematics, or Engineering and three years directly related Computer Programming experience. Must have experience on mini and super-mini computer systems such as Burroughs and NCR or its equivalent. Must have knowledge of database systems and design. Must have experience in systems computers. Must have knowledge of Payroll System including payroll taxes and state payroll tracking. 40 hour work week, \$40,000 per year. Apply at the Texas Employment Commission, TEC Building, Austin, Texas 78778. Job order #4703365. Ad paid by and Equal Employment Opportunity Employer.

## INTERNATIONAL APPLICATIONS SPECIALIST

40 hours per week \$31,500 per year

This position is responsible for independently developing specifications for complex software programming applications. Modifies or maintains the most complex existing software packages. Designs, codes, tests, and debugs the most complex software programs. Responsible for applications dealing with the overall operating systems, such as sophisticated file maintenance routines, large telecommunications systems, and advanced multi-currency financial applications. Participates in the installation of accepted systems and designs and systems and assists in integrating the new system with existing systems. Requires a B.S. Degree in math or computer science, and be able to read and write Arabic. Overseas travel to the Middle East is also required.

CONTACT: Louisiana Job Service Office  
J.O. #456325  
1991 Woodlake Boulevard  
Baton Rouge, LA 70806

## COMPUTER TECHNOLOGIES

**FACULTY POSITION**  
Purdue University School of Engineering and Technology at Indianapolis. An opening in the Computer Technology Department at Indiana University-Purdue University at Indianapolis (IUPUI) is available August, 1988. Applicants must have some background in IBM hardware and systems analysis and design. Some knowledge of personal computers would be helpful. Business or industrial experience, teaching experience, and a minimum of a master's degree are required. Rank and salary dependent on qualifications. Please send resume by December 31, 1987 to: Professor Robert G. Crozer, Chairman, Search and Screen Committee, Indiana University at Indianapolis, P.O. Box 647, 1201 East 38th Street, Indianapolis, Indiana 46223.

AN AFFIRMATIVE ACTION  
EQUAL OPPORTUNITY EMPLOYER

## COMPUTER CAREERS NETWORK

Now you can recruit the best qualified computer and communications professionals regionally, nationally and weekly.

### How?

With IDG Communications new Computer Careers Network. Choose from the Network's eight computer-related newspapers and tailor your recruitment message to the type of talented professionals you need to reach - professionals that read *Computerworld*, *InfoWorld*, *Network World*, *Digital News*, *Federal Computer Week*, and *Computer Currents*. Then, target your audience by region. Or blanket the entire nation.

Call your local sales representative today for more information about Computer Careers Network's regional, national and weekly reach.

**Sales Offices**  
John Corrigan, Recruitment Advertising Sales Director, 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171; 617-879-0700. **BOSTON:** 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171; 617-879-0700. **ALBANY:** Regional Manager, Nancy Percival, Account Executive, 800-343-6474. (in Massachusetts, 617-879-0700). **NEW YORK:** Paramus Plaza I, 140 Route 17 North, Paramus, NY 07652; Warren Kolber, Regional Manager, 201-967-1350; Jay Novack, Account Executive 800-343-6474. **WASHINGTON, D.C.:** 3110 Fairview Park Drive, Ste 1040, Falls Church, VA 22042; Katie Kress, Regional Manager, 703-876-5100; Pauline Smith, Account Executive, 800-343-6474. **CHICAGO:** 2600 South River Road, Ste. 304, Des Plaines, IL 60018; Patricia Powers, Regional Manager, 312-827-4433; Ellen Cross, Account Executive 800-343-6474. **LOS ANGELES:** 18004 Sky Park Circle, Ste. 100, Irvine, CA 92714; Barbara Murphy, Regional Manager, 714-827-0164; Ellen Casey, Account Executive, 800-343-6474. **SAN FRANCISCO:** 18004 Sky Park Circle, Ste. 100, Irvine, CA 92714; Barbara Murphy, Regional Manager, 714-827-0164; Chris Glenn, Account Executive, 800-343-6474.

## IDMS SPECIALISTS

Our company is an MIS consulting firm that specializes in Cullinet products. We are currently experiencing a national expansion due to a 40% growth rate. Our current staffing requirements include: ● Database Administrators ● Project Leaders ● Analysts ● Designers ● Programmers ● Applications.

We offer an outstanding compensation package and an opportunity to help achieve your career goals. If you are interested in growing with us and have IDMS experience, call or send your resume ASAP to:

William P. Geschke  
**Telemap Corporation**  
4401 Rockside Road, Suite 407  
Independence, Ohio 44131  
(216) 447-9300

**telemap**  
CORPORATION

## EDP/MIS Midwest thru Southeast

Project Managers (Bank Sys) To \$50K  
Sys An's (Bank, Mfg, Com) To \$45K  
Prog's P/A's (Bank, Mfg, Com) To \$42K  
DB An/Adm (MIS, DMS) To \$45K  
Sys Prog's (MIS, VM, IDMS, IMS) To \$65K  
Pref: IBM S/36 Thru 3090 M/P, DEC VAX,  
TANDEM, COBOL, BAL, RPG I-III, C, TAL,  
VMS, UNIX, MVS, DOS/VS, IMS, IDMS,  
CICS, AD/IO, PATHWAY

Call: Robert Ekey, CPC

**FOX-MORRIS**  
4700 Rockside Rd, Suite 400  
Cleveland, OH 44131  
(216) 524-6565

## COBOL IMS DB/DC

Minimum of 3 years programming experience mandatory. TWA offers excellent salary and benefits including worldwide travel privileges. Interested and qualified candidates are invited to submit their resume to: TWA, AIS Technical Careers, P.O. Box 20007, K.C., Mo. 64155. EOE M/F/H/V.

**TWA**

## COMPUTER CAREERS NETWORK

Now you can recruit the best qualified computer and communications professionals regionally, nationally and weekly.

### How?

With IDG Communications new Computer Careers Network. Choose from the Network's eight computer-related newspapers and tailor your recruitment message to the type of talented professionals you need to reach - professionals that read *Computerworld*, *InfoWorld*, *Network World*, *Digital News*, *Federal Computer Week*, and *Computer Currents*. Then, target your audience by region. Or blanket the entire nation.

Call your local sales representative today for more information about Computer Careers Network's regional, national and weekly reach.

### Sales Offices

John Corrigan, Recruitment Advertising Sales Director, 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171; 617-879-0700

**BOSTON:** 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171; Al DeMille, Regional Manager, Nancy Percival, Account Executive; 800-343-6474. (in Massachusetts, 617-879-0700).

**NEW YORK:** Paramus Plaza I, 140 Route 17 North, Paramus, NY 07652; Warren Kolber, Regional Manager, 201-967-1350; Jay Novack, Account Executive 800-343-6474.

**WASHINGTON, D.C.:** 3110 Fairview Park Drive, Ste 1040, Falls Church, VA 22042; Katie Kress, Regional Manager, 703-876-5100; Pauline Smith, Account Executive 800-343-6474.

**CHICAGO:** 2600 South River Road, Ste. 304, Des Plaines, IL 60018; Patricia Powers, Regional Manager, 312-827-4433; Ellen Cross, Account Executive 800-343-6474.

**LOS ANGELES:** 18004 Sky Park Circle, Ste. 100, Irvine, CA 92714; Barbara Murphy, Regional Manager, 714-827-0164; Ellen Casey, Account Executive, 800-343-6474.

**SAN FRANCISCO:** 18004 Sky Park Circle, Ste. 100, Irvine, CA 92714; Barbara Murphy, Regional Manager, 714-827-0164; Chris Glenn, Account Executive, 800-343-6474.



**Experienced Software Developers**

LAI has immediate openings for you using System V and/or 4.3BSD UNIX® operating systems. Our current projects involve: super-computer, multi-processor and supermicroprocessor systems. Projects you can contribute to include:

- A UNIX® port to multiprocessor supercomputer class machine;
- System V and 4.3BSD ports to 680x0 based micro-processors;
- 4.3BSD port to a new high speed VLSI processor;
- System V co-existence with a traditional mainframe operating system;
- System V study and port for a major supermini;
- NFS™ Product development for System V, VMS, and other systems and;
- Product development of STREAMS TCP and other protocols.

These positions require 3 years of UNIX/C programming with specific experience in: Kernel programming (System V and/or 4.3BSD), development and/or support of network protocols, and System V STREAMS.

Opportunities also exist for experienced project leaders and technical writers.

For consideration, send your resume to:



Lachman Associates, Inc.  
1901 N. Naper Boulevard  
Naperville, IL 60540-1031  
Attn: Staffing-CW

LAI is an EOE

UNIX is a registered trademark of AT&T  
NFS is a trademark of Sun Microsystems

**Systems Engineer****Washington, D.C. Area**

NCR, one of the most successful companies in advancing information processing technologies, is seeking a widely experienced professional to become a key member of our marketing team.

From the start, you'll be involved up-front with pre- and post-sales activities, including technical RFP review, developing proposal responses and conducting LTD's and benchmarks. This senior position requires 15 years of EDP experience with at least 5 years in UNIX\* systems, including some experience in V5.2 (V5.3 a plus). You must be able to integrate and demonstrate UNIX\* software packages in a pre-sale environment. A Bachelor's degree in a computer-related field is preferred.

As a \$4.9-billion computer industry leader, we offer an attractive compensation and benefits package, along with the potential for fast-moving opportunity. Please send resume or letter describing your background to:

Ms. Cheryl Snyder  
Regional Personnel Manager, Dept. G56  
NCR Corporation  
401 Harrison Oaks Boulevard, Suite 101  
Cary, NC 27513

When you know where we're going,  
you'll choose NCR.

An equal opportunity employer.

\*UNIX is a registered trademark of AT&T.

**SYSTEMS ANALYST**

Growth oriented Fortune 500 public corporation  
has a SYSTEMS ANALYST position available immediately  
at our La Crosse Headquarters

Responsible for system design and new project development in our information Systems Department. Our large Burroughs mainframe and COBOL programming environment requires 3-plus years of Systems Analysis experience.

Excellent written and oral communication skills and strong leadership, problem-solving, and analysis skills are essential. Experience with financial systems, a must.

We offer a competitive salary, excellent benefits and a beautiful location within our challenging atmosphere.

Please forward your resume and salary history to:

G. HEILEMAN BREWING COMPANY, INC.  
Attn: Corporate Personnel Department  
P.O. Box 459  
La Crosse, WI 54602-0459

# "YOU CAN'T DO THAT"

**B**uild a large scale mainframe computer that will outperform the competition's leading model?

"IMPOSSIBLE!" they said.

But Amdahl did it back in the early 1970's. And today we are a leader in the development, manufacturing, marketing and support of general purpose and scientific computer systems, storage products, communications systems and software.

In less than two decades we have grown from 5 to more than 7,000 "can do" employees around the globe. Our success is a result of teamwork, innovation and commitment to achieve the impossible. If you are ready for challenge, creativity and growth, explore your opportunities with Amdahl in one of the following areas:

## PERFORMANCE MEASUREMENT TOOLS DEVELOPERS

**YOU CAN** work on our UTS\*\* development team to design, implement, test and maintain UTS\*\* performance monitoring and measurement tools as well as develop capacity planning tools for Amdahl's 5890 mainframe. Duties will include analysis and measurement of system I/O activity and internal kernel data flow.

Experience should include 3+ years' performance measurement and optimization of large systems. Knowledge of operating systems architectures and understanding of UNIX\* and/or large systems a plus.

Position also available in performance certification. Experience should include 3+ years of performance evaluation, tuning and benchmark development/testing.

Both positions require a BSCS or equivalent. To apply, call Bill McCarthy at (800) 538-8460, ext. 8943, between 9:00am and 5:00pm Pacific Time. Or send your resume to: B. McCarthy, Amdahl Corporation, Employment Department, Dept. 10-4A, P.O. Box 3470, M/S 300, Sunnyvale, CA 94088-3470.

## UTS\*\* SYSTEMS PERFORMANCE SYSTEMS PROGRAMMERS

**YOU CAN** join our Corporate Computer Center and be involved in the early stages of the implementation of a UTS\*\* (UNIX\*) system that allows 300 concurrent logins and runs 800 concurrent processes. Use your UNIX\* internals experience to establish methodologies and procedures in measuring UTS\*\* performance on our mainframes.

Experience should include 3+ years of UNIX\* systems administration and strong C language skills in the support of Amdahl's 5890's running virtual and native UTS 1.2\*\*. BSCS or equivalent is required.

To apply, call Charlotte Mudd at (800) 538-8460, ext. 7686, between 9:00am and 5:00pm Pacific Time. Or send your resume to: C. Mudd, Amdahl Corporation, Employment Department, Dept. 10-4B, P.O. Box 3470, M/S 300, Sunnyvale CA 94088-3470.

# YOU CAN AT amdahl

Amdahl is proud to be an equal opportunity employer through affirmative action.

\*UNIX is a registered trademark of AT&T

\*\*UTS is a registered trademark of Amdahl Corporation

Principals only, please.

**S38 Salary Survey**

Do you wonder what your worth is in the marketplace? Dunhill of Albuquerque, specializing in S38 recruitment since 1981, recently conducted a national survey that reveals interesting trends in salaries by region and industry, importance of degrees, and future prospects for S38 professionals. If you would like a copy of the survey and/or assistance in your next career move, please write or phone Deanna Gear at:

DUNHILL OF  
ALBUQUERQUE, INC.

1717 Louisiana NE, Suite 218C  
Albuquerque, NM 87110  
(505) 262-1971  
Exclusively Employer Retained

**TRAVELING PROGRAMMERS UNISYS 1100**

Computer consulting firm needs programmers and analysts to support customers at various U.S. locations. Requires 2 to 10 years U1100 DMS-COBOL programming, or U1100 EXEC or TELCON support. Project leadership helpful. Salaries to \$55,000. Call collect or send resume.

COMPUTER STAFFING  
1100B1 Talbert Avenue  
Fountain Valley, CA 92708  
714 / 964-2822

**METAPHOR PROGRAMMER ANALYST**

Fortune 500 firm needs a talented Metaphor professional to develop and support Marketing systems. Knowledge of SQL preferred. Any exposure to FOCUS, RAMIS, NO-MAD or SAS a big plus. Salary to \$36,000 great relo. pkg.



ROBERT HALF  
Data Processing  
7733 Forsyth Blvd.  
St. Louis, MO 63105  
314-727-1535



## Software Professionals

Keep your career on target with a company on the right track.



Software AG provides superior data base management products and complete fourth generation applications for IBM, VAX and other systems. In the U.S. alone, we support a product line of more than 35 software tools. Worldwide, we provide products and services to over 2500 computer installations. And we're far from finished.

For us, 1987 has been a year of exciting change. We've created new marketing and service programs, expanded our sales and support teams, and introduced several welcome additions to an already impressive range of products.

Moves like these keep Software AG on the right track in this dynamic industry. Now you can be a part of our success. We're looking for software professionals with two years of experience with ADABAS/NATURAL and applications development or system software experience. BS in Computer Science (or equivalent experience) is preferred.

Positions are available in major metropolitan areas and in the following areas:

- Product Support
- DEC Support

- Project Leader/Program Analysts
- Training
- Development
- Sales Support
- Quality Assurance

Target your career with a company that's already on the right track: Software AG. You'll thrive in a progressive, challenging environment where there's ample room to grow. Plus we offer a competitive salary and exceptional benefits, including excellent medical and dental coverage, three weeks vacation your first year, and full tuition reimbursement. To apply, please send your resume in confidence to N. Phalen at Software AG of North America, Inc., 11800 Sunrise Valley Drive, Reston, VA 22091.

**SOFTWARE AG**  
OF NORTH AMERICA, INC.

EO M/F/H/V. Principals only

## SYSTEMS PROGRAMMING MANAGER

Stevens Institute of Technology, a leading institution of higher education, is seeking to identify a qualified Systems Programming Manager to coordinate all systems software development and support for VAXclusters, DECsystems, MicroVAX II's, campus wide Ethernet, local departmental networks, connections to several national networks and over 1500 microcomputers and workstations.

The Systems Programming Staff is responsible for supporting a variety of computing resources ranging from microcomputers through mainframes. Knowledge of operating systems, systems programming, higher level language programming, assembly language programming, state-of-the-art programming techniques, as well as the ability to supervise software design, development and maintenance. Experience supporting VAX systems under VMS, with DECnet and/or TCP/IP and related systems software is essential.

Responsibility of the Programming Manager will include supervising and coordinating the activities of the Systems Programming Staff, project and system management, analysis and design of new systems and network standards and software, evaluation and recommendation of software products and services, performance analysis and tuning, technical support, and interaction with network and operations support staff.

The position requires supervisory and design experience, good project leadership and communication skills as well as a Bachelors degree. Experience using DEC equipment is required. The Systems Programming Manager reports to Director of Computing and Communications Resources. If qualified, send your resume including salary history to: Mr. James M. Nast, Director of Personnel Relations, Stevens Institute of Technology, Castle Point, Hoboken, New Jersey 07030.



**Stevens Institute of Technology**

An Affirmative Action/Equal Opportunity Employer M/F

# SYSTEMS OPPORTUNITIES

**Northrop Electro-Mechanical Division in Anaheim, Southern California**, is searching for systems professionals. Design and implement improvements to an already highly sophisticated, integrated HP, IBM, DEC, and WANG environment with the company that recently earned a place in the bestseller *The 100 Best Companies To Work For In America*<sup>1</sup>. Write today.

### SYSTEM SPECIALIST

Your responsibilities will include maintaining program product software for our HP systems, performing and supporting image database administration, along with providing HP system capacity planning and performance measurement. You will also coordinate systems security, support disaster recovery, and contingency planning efforts. To qualify, you must be a self-starter with five to seven years of related experience; bachelor's degree in related field preferred.

### SR. SYSTEMS ANALYST

You will be expected to manage performance measurement, capacity planning and tuning on IBM, HP, DEC and WANG systems. In addition, you will coordinate and implement logical security systems and support program products. We're seeking an individual with a technical understanding of system performance and logical security concepts, data base management principles and one year of system enhancement experience. At least three years related experience and a bachelor's degree or equivalent in related field are necessary.

### INFORMATION RESOURCE PLANNING SPECIALIST

Act as a lead planner defining PMS-related user requirements, and propose and implement solutions to defined

requirements based on cost and efficiency analysis. Tasks include performing feasibility studies, development of system architecture, preparation of systems and programming specifications. You will also provide technical support to the programming staff, perform code walk-through assuring codes are performing to standards set by the organization, and develop as well as conduct test scenarios. Develop instruction manuals and integrate system developed throughout the user organization. Excellent knowledge of the HP3000 operating system, PMS software, FORTRAN 77, proven interpersonal relations with users, and project management experience a must to qualify for the position. Bachelor's or Master's degree in related field preferred.

Also requires ten plus years experience in planning, designing, developing and/or implementing computer configuration manufacturing application.

### SENIOR COMPUTING ANALYST

Maintain current business applications running on HP3000. Enhance and modify systems as required. You will also act as project leader on assigned application projects.

Five plus years experience with MRP, material and related systems. Thorough knowledge of FORTRAN, COBOL, TDP and HP3000 systems. Bachelor's or Master's degree in related field preferred.

For immediate consideration, please send your resume to: **LINDSEY WILLARD, NORTHROP ELECTRO-MECHANICAL DIVISION, Personnel Administration, 500 E. Orangewood Ave., Dept CW998, Anaheim, CA 92801.** Northrop provides a comprehensive and competitive benefits package.

**MODEM USERS:** You can access a complete listing of career positions now available with your home computer and a modem. Dial (213) 938-5539 and enter the password "Career Access" for 24-hour information. **BI settings: data 8, stop 1, no parity, full duplex 300/1200/2400 baud.**

**U.S. CITIZENSHIP REQUIRED.** Northrop is an Equal Opportunity Employer M/F/H/V.

<sup>1</sup>Levering, Moskowitz and Katz, *The 100 Best Companies To Work For in America* ©1987, by New American Library, reprinted by arrangements with Addison-Wesley Pub. Co. Inc., Reading, MA 01867

## NORTHROP

**Electro-Mechanical Division**  
**Electronics Systems Group**

### PROGRAMMER

Central Louisiana Electric Company, located in Pineville, LA, has an immediate opening for an individual with IBM 308X, MVS/XA, COBOL, CICS, ISPF and VSAM experience. College degree in Computer Science or related field and a minimum of 4-5 years experience. Please send resume with salary requirements to:

Central Louisiana Electric Company  
Attn: Employment Supervisor  
P.O. Box 5000  
Pineville, LA 71361-5000

CLECO is an Equal Opportunity Employer

### NEW OPENINGS/Fee Paid

**MANAGERS, SW PRODUCT DEVEL.**  
New Micro-N.E. 565-B0K  
MANHATTAN-RIDGE, INC.  
11 Mountain Ave. P.O. Box 514  
Bloomfield, CT 06002 • (203) 243-2424

**PROGRAMMERS, ANALYSTS, & HARDWARE ENGINEERS**  
NSP SERVICES DEPT. CT  
One Cherry Hill Mall, Suite 700  
Cherry Hill, NJ 08002 • (609) 667-4468

**GCOS • EDMS • UNIX**

**EXETER 2100**  
Computer Park P.O. Box 2120  
Hampton, NH 03842 • (603) 258-7328

**computer/net**

### NCR VRX OPERATING SYSTEMS CONSULTANT

Computer Consulting Systems Inc. is seeking a systems analyst with 2 or more years experience with NCR VRX Operating System for several consulting projects. All responses will be treated confidentially. Contact:

Norman R. Cohen  
Computer Consulting Systems Inc.  
1950 North Park Pl.  
Bldg. 500  
Atlanta, GA 30338  
(404) 955-5525







# THE INTERCHECKS TEAM

People Who Work Together

INTERCHECKS INC.

With an excellent reputation for personable, dependable service, Interchecks is one of the nation's foremost manufacturers of business and personal checks. Our staff is dedicated to working together in reaching a common goal: a quality product. Dynamic growth and continued success has created openings in the following Data Processing areas:

**Systems Manager:** 5-10 years project management responsibility with a strong track record of successfully implementing medium to large scale systems.

**Application Supervisor:** Five years of data processing experience with a strong lead analyst background.

**Programmer Analyst:** 3-5 years of data processing experience with a heavy emphasis on System 36 and RPGIII.

You'll enjoy an outstanding salary and excellent benefits including medical/dental/life insurance and paid holidays, sick days, and vacations. Our progressive environment promotes professional and personal growth. Join a team that works together by forwarding your resume with salary history to: 87-41, C. Brinker, Interchecks, Inc., P.O. Box 24307, Seattle, WA 98124. Equal Opportunity Employer.

Data Processing

## ACP-TPF

YOU'LL LOVE MIAMI  
NO STATE INCOME TAX  
FAMED BEACHES & PARKS

PROGRAMMERS, PROG/ANALYSTS, TEAM LEADERS

APPLICATIONS AND SYSTEMS

### WE ARE:

A profitable expanding computer automation company combining EASTERN and CONTINENTAL'S data processing talent.

### WE OFFER:

Attractive compensation and relocation packages, worldwide travel privileges, vacation after 6 months, Comprehensive Health-Dental-Vision-Life and... More INNOVATIVE programs, such as: Flexible (pre-tax) spending accounts, employee referral bonuses, and PC purchase program. We provide extensive technical and/or managerial career paths, excellent working conditions, and many challenging new design projects such as AMADEUS. Our professional management will synergize your traditional and maverick talents in building your career!

### WE'LL TRAIN:

Selected experienced **ASSEMBLER** programmers in ACP/TPF, IBM's premier State-of-the-Art Real-Time Operating System. Opportunities also exist for degreed entry-level trainees with BAL coursework.

### DISCOVER SOUTH FLORIDA:

Affordable, energetic, cosmopolitan, renowned culture, pro-sports, vibrant economy, distinguished schools, splendid, fulfilling year-round living for families and singles lifestyles!! Respond in confidence, with present salary (handwritten resume is fine), today to:

## System One

One System Does It All

SYSTEM ONE CORPORATION  
SUBSIDIARY OF TEXAS AIR  
9300 NW 36 STREET  
(MIACP, Room 1024)  
MIAMI, FL 33178  
ATTN: C.W. WEXLER

Equal Opportunity Employer

### MAINE - N.H.

We have specialized in data processing professional placement in Maine & N.H. for a fifth of a century. If you qualify for positions in the \$25-\$50,000 range, please contact us in total confidence. Our clients pay our fees and provide relocation assistance.

**ROMAC.**

Attn: Dept. 2  
P.O. Box 7040 DTS  
Portland, Maine 04112  
(207) 773-4749

### ONLINE & DATABASE ATLANTA & SOUTHEAST

\$25,000 to \$60,000

Word Processing, Programmer Analysts, Data Entry, and Computer Programmers in IBM, RPG, and other environments.

Send resume to:  
Jim Heard  
EDP Consultants, Inc.  
3067 Bunker Hill Road,  
Suite 202  
Marietta, Georgia 30062  
404-971-7281

## WHY CHOOSE UNITED AIRLINES?



Because when it comes to sophisticated needs and systems technologies it's hard to beat us in or out of the airline industry. What it means is big-time projects, big-time technology, and big-time opportunity. Look at our environment.

We hold a position as one of the nation's 10 largest in information systems installations and one of the world's largest private networks. We have an integrated digital backbone network for voice, data, and image telecommunications applications where all data will be implemented as an SNA logical network with voice applications sharing the same transmission resources. At our Denver Apollo Center, multiple CPUs contain nearly 20 million fares supporting over 60,000 terminal devices and over 8,000 travel agencies worldwide, with a processing capacity of 1,400 messages per second. At our Chicago Center, high volume applications development efforts are continuing to meet unique and complex business needs where we're using a variety of leading edge software products and productivity tools.

Our Chicago and Denver Data Centers are supported by leading edge, large scale environments, including IBM 90XX/30XX/43XX, 3725s, PS/2s, 3705s, Sperry 1100-93, DCP 40s, MVS/XA, TPF 2.3, NCP/VTAM, VM/CMS, MS/DOS, and OS/1100. We're using CICS, IDMS, SQL, COBOL, ASSEMBLER, FOCUS, and "C".

### OPPORTUNITIES:

#### CHICAGO

##### TECHNICAL SUPPORT

- Sperry-Exec Systems Programmers
- IBM MVS/XA Systems Programmers
- CICS Systems Programmers
- DASD Performance/MVS IO Configuration Analysts

##### COMMUNICATIONS

- Network Communications Specialists
- SNA Network Design Engineers
- Transmission Engineers (Satellite/Microwave/Fiber Optic)
- SNA Network Capacity Planning/Performance Engineers
- NCP/VTAM Systems Programmers

##### APPLICATIONS DEVELOPMENT

- Programmer Analysts (IBM COBOL)
- Sr. Programmer Analysts (IBM COBOL)
- "C" Programmer Analysts
- Systems Analysts (MVS background)
- FOCUS Consultants
- IDMS Data Base Analyst
- Micro Data Base Administrator (SQL)

#### DENVER

##### ACP/TPF APPLICATIONS & SYSTEMS

- ACP/TPF Applications Programmers
- ACP/TPF Systems Programmers
- Coverage Programmers
- ASSEMBLER Language Programmers

##### COMMUNICATIONS

- Communications Design Analyst
- ACP/TPF Communications Systems Programmers
- Transmission Engineer (Satellite/Microwave/Fiber Optic)
- SNA Network Capacity Planning/Performance Engineers
- NCP/VTAM Systems Programmers
- SNA Network Design Engineers

At United, we offer attractive salaries and benefits including air fare travel privileges and relocation assistance. Send resume, indicating if any preference for Chicago or Denver, to: United Airlines, Professional Employment, EXOPX-CW10-052, P.O. Box 66100, Chicago, IL 60666. Equal Opportunity Employer. Principals Only.

**UNITED AIRLINES**

The World Is Looking Up To Us.

## Computer Security Specialist

For over 200 years, Bank of Boston's most valuable resource has been the collective skills, knowledge and creativity of our employees. Today, we depend on that resource more than ever. As one of America's largest banks, we have the strength to offer you this career opportunity. If you're determined to succeed, we'd like to put our strength to work for you.

In this key position, you will develop policies and standards to provide effective access security for all corporate information resources. These include computers, software, telecommunications, programs, data and documentation for the entire bank. In addition, you will contribute to the development and implementation of training and awareness programs, technical consultation on computer security issues, and overall corporate contingency planning and testing function. We require a BA or BS and 5 to 7 years of banking-related computer security or EDP auditing experience. You must have good security instincts, excellent written and verbal communication skills, and the ability to interact successfully with all levels of management. A background in data processing and telecommunications is highly desirable. Limited travel is also required.

We can offer you a competitive salary and an outstanding benefits package. Please send resume and salary requirements to: M. Heidi Forti, Employment, 01-11-03, Bank of Boston; P.O. Box 2016, Boston MA 02106.

Put our strength to work for you.



**BANK OF BOSTON**

An Equal Opportunity Employer  
©1987 The First National Bank of Boston

## ENGINEERS

EG&G, Idaho, Inc., prime operating contractor for the Department of Energy's National Engineering Laboratory, has immediate openings in its Electronic Engineering Group for the following:

**Senior Engineer****Software Engineering Design & Development**

Performs independent software engineering design and development tasks using established ideas and design techniques. Requires some background in formal software design methodologies, UNIX and VMS operating system, FORTRAN, and C programming languages. Prefer experience with SUN work station.

**Senior Engineer****Hardware Engineering Design & Development**

Performs independent computer hardware engineering design and engineering tasks using established ideas and design techniques. Requires background or experience configuring and integrating computer hardware and data communications equipment.

**Engineering Specialist****Program Development & Software Integration**

Provides highly advanced engineering knowledge and technique to aid in the development of new or substantially improved computer systems. Perform as principal investigator or software team leader overseeing program development and software integration. Requires experience in formal analysis and design methodologies, familiarity with data base design, SQL, 4th generation languages, knowledge of UNIX and VMS operating system, and C programming language.

**Engineering Specialist****Hardware Definition & Systems Integration**

Provides highly advanced engineering knowledge and technique to aid in the development of new or substantially improved computer systems. Perform as principal investigator or hardware team leader overseeing hardware definition and systems integration. Requires experience in building and installing hardware systems including computers, video, audio, and data communications. Experience working with fiber optics also desirable.

All positions will need, or have the ability to obtain, a DOE "L" or "Q" Clearance. Applicable Technical Bachelor's degree required. MS preferred.

Idaho Falls is located in the heart of the country's most scenic recreational areas. If interested and qualified please submit resume with salary history, in confidence to: **Employment Services, (TBD-25), EG&G Idaho, Inc., P.O. Box 1625, Idaho Falls, Idaho 83415.** We are an equal opportunity employer M/F/H/V. U.S. Citizenship required.

UNIX is a registered trademark of AT&T



Idaho, Inc.

**MIS PROFESSIONALS**

USAir, an innovative and progressive airline is growing and we are seeking exceptional individuals to grow with us here at our suburban Washington, D.C. Computer Center.

Competitive salaries, an excellent benefits package with unlimited travel privileges, and state-of-the-art facilities await candidates with the background and experience to match these challenging positions:

**MVS SYSTEMS PROGRAMMER**

Position requires 2-3 years solid XA systems experience with installation, maintenance, tuning and support of program products.

**IMS DATA BASE ANALYST**

2-3 years proven experience in data management, database administration and quality assurance in an IMS environment required. Position requires interpreting and documenting end user information needs, utilizing userviews, data dictionary tools and procedures.

**TPF PROGRAMMER/ANALYSTS**

2-3 years increasing experience in problem analysis, program specification, coding in ASSEMBLER and testing of TPF applications software supporting marketing and flight systems.

Join our successful team of professionals by forwarding your resume to **USAir Employment Services Dept. OCW, P.O. Box 15846, Arlington, Virginia 22215. EEO/MP. PRINCIPALS ONLY.**

**University of Nevada System****Executive Director of Computing Services**

The University of Nevada System, a state-wide system with an enrollment in excess of 50,000 students and comprised of two universities, four community colleges and a research institution, is seeking applicants for the position of Executive Director of Computing Services. University of Nevada System Computing Services maintains several sites throughout the state, connected by a state-wide network and provides computing support for the instructional, research, and administrative activities of the entire University of Nevada System.

The UNCS Executive Director whose office is in Reno, Nevada reports to the Chancellor of the University of Nevada System, receives policy recommendation from the UNCS Computing Policy and Planning Committee, and is responsible for the administration of the University of Nevada Computing Services. Responsibilities include, but are not limited to, planning, budgeting, state-wide telecommunications, technological consultation, and coordination of campus and regional computing services. The salary will be in the range of \$60-\$70K annually, commensurate with experience.

Candidates must have extensive knowledge and broad experience in instructional, research and administrative computing needs and applications, telecommunications, and information technology. Management experience must include a minimum of 5 years of significant academic and/or service orientation. Will have outstanding communications skills and experience in communicating effectively with academicians, administrators, and technicians, and will have demonstrated ability to plan for short and long range objectives and to coordinate diverse services. A Masters degree or equivalent is required; a Doctorate preferred.

Interested candidates should submit a letter of application, a resume, and three letters of reference by December 1, 1987. Please send applications to:

Dr. Warren Fox, Chair  
UNCS Executive Director  
Search Committee  
University of Nevada System  
400 Marsh Avenue  
Reno, NV 95959

THE UNIVERSITY OF NEVADA SYSTEMS IS AN EQUAL OPPORTUNITY/AFFIRMATIVE ACTION EMPLOYER.

**Computer Professionals****Systems Programmers****Analysts and****Programmer Analysts**

IMS/DB/DC or DL (Learn DB2) \$32-38K  
P/A DBMS/ADSO 32-38K  
Sys. Prog MVS/XA, IMS or CICS TO 46K  
P/A-FOCUS/COBOL 35K  
COBOL Prog (Train CICS) 22-38K  
P/A-SIA Life/10, COBOL/ASSBRT 41K  
P/A-SIA Sys 38, RPL/1 34-38K  
P/A MVS/OS/VS/VS/VS 40-42K  
P/A CMS/OL-1/INOMAD 26-38K  
P/A CICS or SAS or DB2 TO 39K  
Bering COBOL/FCL TO 37K  
TANDEM/TAL P/A or PL/1R 27-47K  
S/A (2 yrs COBOL/MSA) 25-37K  
Sys 36-38 MAPICS TO 38K  
DEC VAX/VMS Manuf 25-38K  
DBA IMS or DB2 32-47K  
P/A DOS/VS/CICS/OL-1 TO 37K  
P/A-SIA IDEAL/DATACOM or ADAS/ASAT 28-38K

**COAST-TO-COAST****Contact RON DOERFLER**

All Fees Paid—Relocation Assistance

**FOX-MORRIS**

212 S. Tryon St./Suite 1350

Charlotte, NC 28261

Call Collect (704) 375-0600

**PERMANENT AND/OR****CONSULTING POSITIONS****NY METROPOLITAN AREA****WANG**

● Sr. Systems Analysts for creative applications development position on the Wang 7310, 4GL, COBOL, SWH or Data Com exp a plus.

**IBM**

● Programmers TPF experience

**DEC**

● Programmers VAX, VMS, Basic

Please call 212-684-3860  
Or Submit Resume to:  
HANK WALSH ASSOCIATES  
475 Fifth Ave., NY 10017

PROGRAMMER/ANALYST: Analyze, design & implement a com'l Mfg Plan's Planning (MRP) System. Applications incl a range of complex mfg data processing, such as sales order, bill of material, inventory, floor planning & cost acctg procedures. Must interface w/engineering staff to write applications, measure work measurements & standards of manpower utility such as work distribution, work control, process flow, economy of worker motions & layout of units. 2 yrs exp. Bachelor's in Computer Sci or Engineering field. Must know: Technical programming & mfg design. IBM Mainframes (370, 3063, 4331); COBOL; ASSEMBLER; CICS; Command-MACRO; VTAM/BDAM; OS/VS 2; MVS/SP; MVS/XA; TSO/ISPF; VSAM; \$34,000/yr. 40 hrs/wk. Pinkerton Computer Consultants, Inc. 20 Broad St. Suite 1302, New York, NY 10005. Send resumes. ATT: AJ # 147.

**MSA SYSTEMS ANALYST**

Sentara Health Systems (SHS) is the largest health care provider in the State of Virginia. SHS is a multi-hospital corporation with several subsidiaries, including Urgent Care Centers, Long Term Care Facilities, Home Health Agencies, and an HMO.

The position of Systems Analyst would be responsible for the technical implementation of all MSA Systems including:

● General Ledger  
● Accounts Payable  
● Human Resources/Payroll

● Purchasing  
● Inventory  
● E.E. Reporting

In addition to MSA product knowledge, applicants must have demonstrated knowledge using MVS, CICS, COBOL and structured systems development methodology.

Sentara Health System offers a competitive compensation and benefits package. For consideration, submit your resume with salary history to:

SENTARA HEALTH SYSTEM  
MANAGEMENT INFORMATION SYSTEMS  
POST OFFICE BOX 2200  
NORFOLK, VIRGINIA 23501

**EQUAL OPPORTUNITY  
EMPLOYER****OVERSEAS****UP TO \$70K U.S. TAX FREE**

Travel Free! Housing, food, medical, dental paid! Exciting lucrative contracts for professionals up to principal level member. This position available in Tokyo and Europe in \$75,000 salary range. Requires knowledge of international Fair-Quote System... ability to design international Fair-Quote software for a TPF system 5 to 15 years ACP/TPF application program design experience. B.S. in computer sciences desirable. Other positions require 3-5 years experience. Guaranteed services. Send resume or call:

(312) 364-7300

**INTERNATIONAL HOTLINES**

2525 E. Oakton  
Arlington VA 22205

**FLORIDA/NEW YORK/  
NEW JERSEY**

COBOL/CICS UNIX/C  
IMS/ADSO CICS/DB2  
TANDEM ASSEMBLER  
CICS/DLI RPL/1 or PL  
FOCUS MANTIS/TOTAL  
IMS/DB/DC ORACLE  
INFORMIX

Many DOS, MVS, UNIVAC, Series 1, Sys 38 and VME. Contract or permanent positions available with min. 2 yrs. exp.

ANALYSTS P.C. SPECIALISTS  
PROGRAMMERS SYS PROGRAMMERS  
TECH SUPPORT PROJ LEADERS  
OPERATORS INFO CTR ANALYSTS  
TELECOMM DOCUMENTATION  
DB DESIGNERS NETWORK DESIGN/SLP

**Startec Unlimited, Inc.**

20295 N. W. 2nd Ave.  
Suite 201

Miami, FL 33160

(305) 651-9200

31-D Woodbridge Terrace

Woodbridge, NJ 07095

(201) 885-0065

Two Positions: assistant/associate professor and instructor of computer information systems. Emphasis on quality teaching an undergraduate and some graduate (professor level) courses under DRMA curriculum. CISM/MS business/industry experience desired. Demonstrated excellence in and commitment to teaching. Degrees: Minimum masters for instructor, PhD or ABD for professor. Salary and benefits competitive. Applications due November 13, 1987. Doctor Dan Collins, Department of CS&M&IT, Box 7068, Tarleton State University, Stephenville, TX 76402. A part of the Texas A&M University System. Equal Opportunity/Affirmative Action Employer.

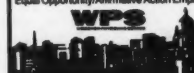
**SENIOR ANALYST  
(IBM COBOL)**

WPS is a major group health insurance company and we are currently seeking an Information Systems Professional with 2-3 years COBOL programming experience. Ideal candidate will have programming and analysis experience on a large IBM system, and some exposure to leadership responsibilities. 2 or more years computer science education is preferred.

This position is an exciting opportunity to work in a large data processing environment. We use an IBM 3084 model QX with the latest releases of VSAM and CICS/DB2.

To apply, send resume and salary history to: Recruiter, 1717 W. Broadway, Madison, WI 53713, or for more information and a free brochure describing Information Systems opportunities at WPS, call 608-221-4711 ext. 3472.

Equal Opportunity/Affirmative Action Employer



**SOFTWARE ENGINEER.** Design, develop, test, install and maintain real time switching software systems in computer language under "UNIX" operating system. Design databases and object-oriented systems for Computer-Aided Design (CAD) applications. Design and implement graphics and user interface programs. Languages required: C, UNIX Shell Programming and Pascal. Some projects are performed on client sites at various geographic locations. Minimum Requirements: M.S. in Computer Science. Six months experience in the position offered or six months experience as a software engineer (testing and installation). One course in each of the following: human computer interaction, programming languages, database management, computer graphics, operating systems and algorithms. Must have completed one major project in object-oriented systems for CAD applications and, user interface to UNIX operating system written in C. Must be willing to travel an average of 25% of time, domestically, 40 hours per week, 9:00 am to 5:00 pm \$33,327 per year. Submit resume to: Illinois Department of Employment Security, 401 South State St., 3 South, Chicago, IL 60605. Attention: Miss S. Chalem, Reference #7309-S, AN EMPLOYER PAID AD.

\*UNIX is a registered trademark of AT&T.

**MIS DIRECTOR**

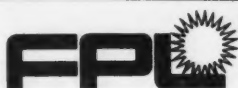
Our client, a Dallas based Financial Services Company, is seeking a seasoned MIS Director to build a new MIS Department from the ground up. The successful candidate will have a minimum of 15 years in Data Processing, of which 5 should be in MIS Management. Knowledge of Securities/Brokerage applications is also a must, ideally having developed systems in the Stock Brokerage industry. Bachelor's Degree required. Compensation is totally negotiable. If you fit this profile please contact:

Robert Brooks & Associates  
5757 Alpha Rd, Suite 302  
Dallas, TX 75240  
(214) 387-3300

**RESEARCH?**

If you do all your research you will find that your options show you that your best source is

**Computerworld**



## FORTTRAN PROGRAMMERS

Florida Power & Light Company has immediate openings at Turkey Point and St. Lucie Plant sites for Fortran Programmers with:

- Proficiency in Fortran (Minimum Two Years Experience)
- Experience with "MODCOMP" Real Time Data Acquisition
- Experience with Interactive Graphics

We offer competitive salaries, an excellent benefit package, and a challenging growth environment. Qualified candidates should submit their resume in confidence to:

Mr. Frank Cooney, Jr.  
Dept. CW-FN  
Florida Power & Light Company  
P.O. Box 029100  
Miami, FL 33102

AN EQUAL OPPORTUNITY EMPLOYER M/F

## SENIOR SYSTEMS PROGRAMMER

Morton Thiokol, Inc., is a leader in the research, design, manufacturing and testing of solid propellant rocket motors. We have an opening for an individual with the following qualifications.

B.S. degree and five years experience in data communications networking on large IBM computers required. Must have telecommunication access methods experience (VTAM, TCAM). Also requires knowledge of Assembly language and NCP. Prefer some DEC and DEC DCL experience.

For consideration, please send resume, with salary history to: M. Fuertsch, Professional Employment, Morton Thiokol, Inc., P.O. Box 524, M/5000C, Dept. CW1014, Brigham City, UT 84302. U.S. Citizenship required. An Equal Opportunity Employer M/F.

## MORTON THIOKOL, INC.

## DIRECTOR OF COMPUTER CENTER

Reports to the Vice President for Finance and Administrative Services. Responsible for planning, organizing and directing all activities of the Computer Center. Bachelor's degree in Computer Science, Mathematics or related field required. Master's degree desired. Required experience includes minimum of 3 years technical supervisory management experience utilizing DEC, IBM, or PRIME mainframe equipment (preferably in an educational environment). Programming experience in COBOL and at least one other high level language. Ability to perform system analysis; experience with mini and microcomputers and good oral and written communication skills. Salary negotiable.

Burlington County College is a comprehensive two-year public community college, offering the AA, AS, and AAS degrees as well as several certificate programs and community service programs. Approximate driving time to the college are 45 minutes from Phila. and the Jersey shore and 90 minutes from New York City.

In order to receive an official college employment application, submit an updated resume and letter of application to: Executive Director of Personnel Affairs, BURLINGTON COUNTY COLLEGE, (CW-6), Pemberton, NJ 08068, (609) 894-9311, ext. 390. Completed applications must be received no later than November 6, 1987 in order to receive consideration. An equal opportunity, affirmative action employer.

250 offices to help you get the best permanent jobs and high \$!

- DATA BASE
- NETWORKING
- CUSTOM LANGUAGES
- SUPER MINTS
- SYSTEMS PROGRAMMERS

Send your resume and current salary to:

THE LESLIE CORPORATION  
400 E. N. Belt, #7100  
Houston, TX 77060  
(713) 591-0915

## Southeast OPENINGS

Fortune 50 company located in North Carolina is seeking experienced Data Processing Professionals with: ADABAS/NATURAL, IDMS or DEC VAX.

Call or send resume to:

**DM DataMasters**

Corporate Headquarters  
P.O. Box 14548, Dept. CWAG  
Greensboro, NC 27416-4548

Call Collect

919-373-1481  
704-523-0078  
919-872-4866

SEE PAID

## SENIOR DATA BASE ANALYST

The successful candidate will be responsible for maintaining an ADABAS database management system to provide database service to implement and maintain system security, to implement and maintain performance monitoring software and to develop improved techniques in the use of database software. Responsibilities include installing, maintaining and monitoring Software AG products for both administrative and academic use. Products include ADABAS, NATURAL, NATURAL SECURITY, PREDICT and REVIEW. Experience with similar products from other companies is acceptable.

The Board of Regents Higher Education Computing System (BOR/HECS) is located in Vermillion, South Dakota at the University of South Dakota campus. A computing center is responsible for state-wide administrative computing functions as well as providing academic computing to all state institutions of higher education. The qualified applicant must have graduated from a college or university with a bachelor's degree in computer science or a related field plus three years of data processing project development experience of which two years must be directly related to systems work, or an equivalent combination of education and experience. The maximum starting salary is \$29,164 annually.

Vermillion is located near the Missouri River in extreme southeastern South Dakota, 60 miles south of Sioux Falls, South Dakota and 120 miles north of Omaha, Nebraska.

Application and/or resume must be postmarked on or before November 6, 1987. For more information call Rachel Barari at (605) 677-5047 or send state application form or resume to University of South Dakota, Personnel Officer, Stage Hall 207, 414 E. Clark Street, Vermillion, South Dakota 57069. The South Dakota Board of Regents is an EOE/AA employer and educational system.

## INDEPENDENT CONSULTANTS

(1099)

with the following expertise:  
ADABAS/NATURAL  
IDMS/R/ADS/O, IMS DB/DC,  
IMS DC/CICS.

Call Jim Lloyd  
(301)731-4231  
or send your resume to:  
PO Box 2817  
Hyattsville, MD 20784.

## CAROL CABLE CO., INC.

Data base Administrator

Applicant should have background in logical and physical data base design as well as SCHEMA and SUB SCHEMA development knowledge. Current system is Unisys 1100/72 with DMS and TIP environment. Knowledge of DB2, ESE, and MCB is a definite plus. Excellent company paid fringe benefits. Easy access to Rt. 95 and 495. Send resume to:

Carol Cable Co., Inc.  
248 Roosevelt Ave.  
Pawtucket, RI 02860.

Equal Opportunity Employer

## CONTRACT PROGRAMMERS

We have immediate openings for senior programmer analysts with a minimum of 4 years experience with one of the following skills: IAS, DB/DC, COBOL, ADF, IDMS, ADSO, FOCUS, NOMAD, Model-204, Prime 9000 Series, PCIS, Mark IV, HP 3000. We offer a major medical plan, our rates start at \$30/hr., we have openings in Los Angeles, CA, Houston, TX, Louisville, MO, Cleveland, OH, and Cleveland, OH. For career opportunities please send resume to:

J.P.S., Inc.  
Attn: George Johnson  
PO Box 690007  
Houston, TX 77269-0007

Or call 713-820-0024. No trainees or part-time positions available. We are an Equal Opportunity Employer.

**SENIOR ENGINEER:** Project scope: design, implementation & maintenance of a medical library system, & the integration with an automated medical office system. Duties: analysis, design program specs & task assignment; supervise other Syst Analysts & Programmers on project tasks. Extensive knowledge in free text database design, interface design, natural language processing, and basic knowledge of medicine. Familiar with both high & low level programming languages, computer networking & communications. Proven experience in conducting research & supervising project are necessary. At least 2 yrs of formal training in a medical science discipline, and MS Electrical Engineering or Computer Science required. Salary: \$40,000/yr 40 hrs/wk. Send resume to Mr. Scott C. Barry, Physicians Computer Systems, Inc., 1333 Gateway Dr., Suite 1014, Melbourne, FL 32904, no later than Oct. 31, 1987.

**PROGRAMMER/ANALYST:** Response for developing small independent programs (programs not dependent on existing computer syst), for garment mfg co. Study current manual syst, gather info on existing syst to develop base for new syst. Design syst & code program in C/BASIC based on spec's. Test & debug small program & implement its use. Perform data entry using Digitan's application programs as Order, Invoices, Shipping & End of Month procedure. Also, mail files & use Wordstar to prep letters & doc's. 6 mos exp or 6 mos rel programming exp. Bachelor's in Computer Sci. Must have exp in DB2 & SDC. \$30,000/yr. 40 hrs/wk. Huntington Sportswear, 210 E. 41st St., Brooklyn, NY 11222. Send resume, Attn: BC.

## Advanced Systems Division

## DATA BASE SPECIALISTS

CALL ELLEN CANE COLLECT AT  
(714) 250-0437  
TO ARRANGE AN INTERVIEW

Northrop Advanced Systems Division in Pico Rivera, Southern California, is searching for Data Base professionals to work with the most sophisticated IMS DB/DC systems in the business, and participate in evolving technologies including relational and distributed DBMS. You'll work with the most advanced technology in an environment which earned us a listing in *The 100 Best Companies To Work For In America*.<sup>1</sup> If you're qualified, call Ellen and meet the challenges of this position.

Senior level and specialist level positions are available for individuals with at least 8 years data processing experience including IMS DB/DC applications analysis and programming, and 3-5 years recent background as a Data Base Analyst or Administrator in an IMS DB/DC and DB2 environment. Background including Manufacturing, Engineering and/or Logistics applications preferred.

You will perform data analysis, modeling and normalization activities in support of a three-schema, data driven approach to application systems development. You will also develop logical and physical data structures, supervise test and production data base maintenance and support activities, provide for data base performance analysis and tuning activities. Develop data base related standards and procedures.

If unable to call, please send your resume including salary history to: Jim Littrell, NORTHROP ADVANCED SYSTEMS DIVISION, Employment Office, Dept. CW2527, P.O. Box 1138, Pico Rivera, CA 90660-9977. Northrop provides its employees with a competitive, comprehensive benefits package.

**MODEM USERS:** You can access a complete listing of career positions now available with your home computer and a modem. Dial (612) 941-5723 and enter the password "Career Access" for 24-hour information. **Bit settings:** data 8, slope 1, no parity, full duplex 300/1200 baud, enter password (Career Access), (CR) upon entry.

**U.S. CITIZENSHIP REQUIRED.** Northrop is an Equal Opportunity Employer M/F/H/V.

Leaving, Moskowitz and Katz: *The 100 Best Companies To Work For In America*, © 1987 by New American Library, registered by arrangements with Addison-Wesley Pub. Co. Inc. Reading, MA 01867

## NORTHROP

Advanced Systems Division

## System Developers 800-231-5920

Inviting resumes from individuals in the more highly technical computer related vocations such as: PHD Computer Scientists, Operating System Developers, Data Base Developers, Porting Specialists, Networks and Telecommunications, Architecture, Artificial Intelligence, Graphics Systems Developers, Microcoders and Firmware Developers, Compiler Development, etc. Special interest in emerging technology such as novel architecture, UNIX, ADA, etc. Similar interest in scientific applications developers including military, process control, data acquisition, telemetry and communications, CAD/CAM, simulation and modeling, etc.—we are a professional employment firm managed by graduate engineers. Fees are paid by the employer. All geographic locations. Send resume or call D.A. Redwine and ask for our free resume workbook & cover letter.

**Scientific Placement, Inc.**

P.O. Box 18849 CW Houston, TX 77228 713/695-6100  
UNIK is a trademark of IBM Corp.



## Experienced Programmer/Analysts

CALL  
US...

## We'll Help You Grow

M.I.S. International is one of Michigan's largest consulting firms for over 16 years, our data processing and engineering professionals have provided services to Fortune 500 firms including the major automobile manufacturers and suppliers.

We are enjoying exceptional growth in both our Michigan and Atlanta Divisions making this a perfect time to step up to a permanent position on our technical staff. We're interested in Programmer/Analysts with at least one year of experience in the following:

- IMS DB/DC, COBOL
- DB2
- CICS, COBOL
- CICS CL, COBOL
- CICS MACRO
- C. UNIX, Business Bkgd.
- IDMS or IDMS-R with ADS/O
- VAX/VMS, FORTRAN
- COBOL, PSO/ISPF

For more information contact: Marie Clark, Director of National Recruiting at 1-800-521-2144 or send your resume to: M.I.S. INTERNATIONAL, Corporate Headquarters, 23380 Commerce Drive, Farmington Hills, MI 48024.



Farmington Hills • Atlanta • Ft. Lauderdale

Equal Opportunity Employer

PROGRAMMERS-  
SCIENTIFIC

Tucson, Arizona

The National Optical Astronomy Observatories have a need at the National Solar Observatory for two Scientific Programmers to participate in the development of an image processing system for helioseismic data from the Global Oscillation Network Group project. Requirements for the Programmer I position include a M.S. in Computer Science or Astronomy; a minimum of three years of experience developing astronomy software; experience with solar image processing; one year of experience in IRAF task and application package development; and proficiency in FORTRAN, C, VAX/VMS and SUN UNIX. Requirements for the Senior Programmer position include an M.S. in Computer Science, Mathematics, Engineering or a Physical Science with a minimum of seven years professional programming experience designing, developing, and maintaining large software systems for image processing and for the management of large data volumes.

In an unclassified, sunbelt location, the NOAO offers an excellent compensation package including 24 days annual vacation and, after one year, a fully vested retirement plan. Please send your resume in confidence to: Judy Rutino, Personnel Manager, National Optical Astronomy Observatories, P.O. Box 26732, Tucson, Arizona 85726.

An EE/AA Employer

ASSISTANT REGIONAL  
INFORMATION CENTER DIRECTOR

Alachua County, located in North Central Florida, is recruiting for an Assistant Regional Information Center Director/Applications. The position will supervise 22 employees and requires graduation from an accredited 4 year college/university with a degree in computer science, math, engineering, business administration or related field and 5 years progressively responsible data systems experience of which 3 years must be supervisory; or any equivalent combination of related training and experience. Prefer strong background in IBM, MIBS, COBOL, CICS, applications development, and project management. Send resume no later than 11/16/87 to Alachua County Personnel, P.O. Box 1467, Gainesville, FL 32602

Equal Opportunity Employer

Intermediate  
Systems Programmer  
with IDMS/R Experience

A+ rated life ins. co., with a firm commitment to excellence, offers competitive salaries and benefits, career paths recognizing individual strengths and leading edge technology.

Currently seeking Inter. Systems Programmer with min. 5 yrs recent IBM mainframe exp to be responsible for installation, maintenance & support of IDMS-R data base. Proficient in all Culinet software, CICS and data base design.

Current environment includes MVS, CICS, COBOL, ALC, VM/CMS, JES 2. Major systems efforts underway using remote communications IDMS-R, ADS/O, IMS/DB and CICS, including replacing existing EDS enhanced AUIS system.

Qualified individuals interested in challenging and rewarding career opportunities invited to send resume with salary requirements. All replies strictly confidential.

**SecurityLife**  
Of Denver

1290 Broadway, Ste. 1600  
Denver, Colorado 80203

## S/38 PROFESSIONALS

If you consider yourself in the TOP 10% of our industry, and would like to be kept informed of potential positions that fit YOUR NEEDS! (Whether it's: Location, Salary, or the chance to work in an environment where you can be happy with a Good Future! Call me, I'll listen and take you where YOU want to go!!!

P/A Manufacturing  
P/A MAFICS  
P/A Distribution  
P/A Financial  
Senior P/A Financial  
Senior P/A Manufacturing  
Degreed/1+ years experience

Locations now available: PA, VA, VT, NC, SC, GA, TN, AK, TX, OK, OH, NY, WI.

HAZEL RASH

(919) 222-0460

**PERSONNEL PLACEMENT, INC.**  
P.O. BOX 1915  
BURLINGTON, N.C. 27215-1915

When you compare costs and the people reached, Computerworld is the #1 medium for computer-related recruitment advertising.

Place your ads today!

Call toll-free

800-343-6474

In Massachusetts

(617) 879-0700

## BUY SELL SWAP

1-800-426-USED

In California (714) 641-0366

IF IBM MAKES IT, WE CAN SAVE YOU MONEY

**Series/1**  
**System/34**  
**System/36**  
**System/38**  
**43 XX**  
**30 XX**

- Top Savings
- Quick Delivery
- Short and Long-Term Leases
- All Models & Peripherals
- New & Used



Marshall Lewis

&amp; Associates, Inc.

Member Computer Dealers  
& Leasing Association

1536 Brookhollow Drive, Building A  
Santa Ana, CA 92705-5426

**BRAND NAME DISKETTES**

**49¢ 29¢**  
Case 5 1/4" DSDD Min. 30 5 1/4" DSDD Min. 100  
20 Min. 50

**79¢**  
5 1/4" IBM AT HD Min. 30

**2 for 1 Replacement Guarantee**  
1 card initially defective within six months  
IBM Service, IBM, Min. 100  
For TYPC values, add 2¢

**99¢ \$1.09**  
5 1/4" DSDD Min. 25 5 1/4" DSDD Min. 25  
Subject to availability Subject to availability

**\$15.90 \$4.29**  
Min. 5 Box of 10  
285 40 MB Min. 200 5 1/4" DSDD Min. 10 Min. 10

**\$19.20 \$5.99**  
Min. 5 Box of 10  
485 120 MB Min. 200 5 1/4" DSDD Min. 10 Min. 10

Immediate shipping - Guaranteed satisfaction  
Call for greater details on larger orders  
IBM's Lifetime Warranty  
Shipping: \$15.00 per box, under \$15.00 each add. to  
MC/VISA accepted

**1-800-537-1600**  
OPERATOR NO.38  
MICRO ELECTRONIC PRODUCTS

## IBM BUY · SELL · LEASE

**36 38 4300**

**SERIES 1**

Processors  
Peripherals  
Upgrades

**IBM SELECT**  
1-800-426-USED  
(714) 847-8486

## ATTENTION IBM 937X USERS

Are you undecided or unsure whether the IBM 937X system will fit your needs and like more time before making a long term commitment?

Chicago Holdings, Inc. will purchase your installed or order IBM 937X system and lease the equipment to you at less than half the IBM monthly rental (minimum term twelve months).  
Longer terms are available if desired.

You may after twelve (12) months terminate, extend, or purchase the equipment at then fair market value.

Call or write to:

Chicago Holdings, Inc.  
1000 RIDC Plaza  
Pittsburg, PA 15238

Attn: Michael J. Daniels  
Vice President - Operations  
Tel.: (412) 963-8870

\*Subject to credit review



# Texran Computer Company

Buy! Sell! Lease!

A T & T - Rolm - Northern Telecom

New & Used Equipment

Acceptable for Manufacturer Maintenance

Immediate Delivery - 30 Day Warranty

Call 214-722-1152

Ask for Telecommunication Dept.

Texran Computer Company

1930 Alpha Dr. Rockwall, TX 75087

• Buy • Sell • Lease • Rent

## IBM. PC's

5150 — 5160 — 5170 — 5171

Displaywriters

5525 — OFFICE SYSTEMS

5219 — 5253 — 5258

6670 PRINTERS

SYSTEM/34/36

CDB FINANCIAL INC.

3520 DILLON ROAD  
DALLAS, TEXAS 75228  
800-648-6791  
214-324-3491

## FOR SALE OR LEASE

IPL 4446 CPU — 16 Meg., 6-Channel  
(Equivalent to IBM 4341 Group 2)

Storage Tech. 8002 Disk Controller  
Storage Tech. 8361 Disk Drive  
Storage Tech. 8362 2X Disk Drive  
Storage Tech. 4550 Tape Cont./Drive  
Storage Tech. 4554 Tape Cont./Drive  
Decision Data 6065-11 Line Printer (600 LPM)  
Decision Data 360/370 Interface

Call R.B. Fields  
(617) 542-1200

## IF YOU'RE BUYING, WE'RE SELLING.

36  
38  
4300

## IF YOU'RE SELLING, WE'RE BUYING.

MINI SYSTEMS Buy • Sell • Lease PERIPHERALS  
(800) 331-8283  
TOLL FREE  
(213) 306-9343  
CALIFORNIA  
Ocean Computers, Inc.  
8055 W. Manchester Ave., Ste 525  
Playa Del Rey, CA 90293

**IBM**  
**HARDWARE**  
**BUY • SELL • LEASE**

SERIES-1  
S/34 • S/36 • S/38  
S/23 • 4300 • POS

**AMCOM**  
CORPORATION  
5555 WEST 78TH STREET  
MINNEAPOLIS, MN 55435  
612-629-7445 800-328-7723

**DEC & COMPATIBLES**

200% REFINANCE  
20% DOWN  
20% CASH  
20% CREDIT

**DIGITAL COMPUTER**  
**EXCHANGE INC.**  
10000 Rte. 1, Suite 100  
Call (618) 887-9188  
FAX (618) 887-9188 TLX 70808

Buy & Sell  
Your  
Equipment  
in  
**BUY - SELL - SWAP**  
Call **COMPUTERWORLD**  
To  
Place Your Ad  
1-800-343-6474;  
In Mass.  
(617) 879-0700



## Searching for a great modem deal?

You found it.

### ■ MP48/4,800 bps

Model 2448-01...New \$2,000...Only \$595  
Point-to-point and multi-point • Rapid set up (RTS/CTS of 25 ms in multipoint operation)  
Model 2448-05...Was \$2,600...Now Only \$595  
ANALYSIS™ Network Management capability  
Model 2448-03...Sold new at \$2,200...Now \$595  
Dial 2088 • For use with 2-wire switched telephone network.

### ■ MP96/9,600 bps

Model 2496-01...Was \$3,400...Now \$895  
Point-to-point • Ability to bridge line transients of up to two seconds.  
Model 2496-03...New \$4,000...A bargain at \$895  
ANALYSIS Network Management capability  
Model 2496-05/06 RP...New \$3,400...Only \$895  
Master or slave models • Point-to-point or multi-point.  
Model 2496-10/11...Was \$4,000...Reduced to \$795  
Same as above except with ANALYSIS capability.

### ■ MP14/4,1/4,400 bps

Model 2698-01/02...New \$8,500...Now \$1,195  
Optional 2-channel mux • 12,000 and 9,600 bps fallback

### ■ LSI 24/2,400 bps

Model 2624-01...New sold for \$950...Now \$395  
Point-to-point or multi-point • 1,200 bps fallback  
Full or half-duplex mode over 4-wire private line circuits.  
Model 2624-10/11...New \$1,450...Now Only \$395  
Same as above except with ANALYSIS capability • Master and slave models

### ■ T-96/New 9,600 bps

Model 2694-01...Was \$2,500...Clearance price \$799  
4-wire point-to-point, half/full duplex • 7,200 or 4,800 bps fallback

All modems (except the T-96 which is new) are refurbished, carry a 90-day warranty, and can be serviced in over 100 locations.  
For a great modem deal, call today and get extra performance for your network at a fraction of the cost you expected to pay.

1-800-482-3333 In Florida call 1-800-342-1140

**paradyne**

**IBM...36, 38, 4300, 30XX** • BUY • SELL • LEASE

UPGRADES  
PRINTERS  
CONTROLLERS  
TAPES  
DISKS  
TERMINALS  
FEATURES

**ICS**

CALL TOLL FREE  
800  
258-2233  
IN CALIFORNIA  
(714) 838-3717

INTERNATIONAL COMPUTER SALES, INC. • 515 E 1st ST, SUITE A • TUSTIN, CA 92680

**IBM**  
**SYSTEM 36**  
**SYSTEM 38**  
**SERIES 1**

4300

NUMBER OF  
WEL

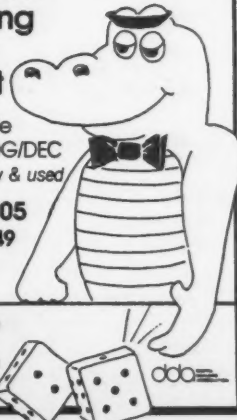
• SPECIAL New S/36 Models D28, D28L, D28M & 358 MB Disk Upgrades  
• Buy • Sell • Lease • Trade • New • Used  
• IBM Warranty/IBM Performance/Quantified Disk • Terminals  
• Flexible Lease Options Tailored to Your Needs • Printers • Tapes

NUMBER OF  
WEL

• Equipment Configured To Your Requirements  
• All CPU Upgrades

**NEWPORT LEASING INC.**  
2 Faraday  
Irvine, CA 92718  
**714/770-2122**

## Don't gamble when buying computer equipment



Call your reliable source for IBM/DG/DEC  
We buy & sell, new & used

(305) 392-2005  
TLX 156 1249



**thomas business systems, inc.**

4301 Oak Circle, Unit 11  
Boca Raton, FL 33431

# NEED MORE MIPS?

## Call 800-243-5307

OCTOBER 1987

Copyright 1987 Randolph Computer Corporation

SYSTEMS			SYSTEMS		
MIPS	MEGABYTES		MIPS	MEGABYTES	
(Millions of Instructions Per Second)			(Millions of Instructions Per Second)		
#3373-20	0.5	4 to 16	3033-UP	5.0	4 to 24
#3373-40	0.5	8 to 16	4381-14	6.8	16 to 32
4331-2	0.5	16 to 4	3033BX	6.8	8 to 32
S-38-300	0.58	8 to 8	#3033-120E	7.2	256 to 128
S-38-400	0.75	8 to 8	14381-24	7.2	16 to 64
4341-1	0.88	2 to 4	3033JX	9.8	8 to 32
S-38-600	0.98	8 to 16	3033-150	9.8	32 to 64
S-38-700	1.1	16 to 32	3033-150E	10.0	16 to 32
#3373-60	1.2	8 to 16	3033-150E	10.0	32 to 64
4381-11	1.4	4 to 16	3033-150E	10.0	16 to 64
4381-15	1.45	2 to 16	3033-150E	10.0	32 to 64
4341-2	1.5	2 to 16	3033-150E	10.0	16 to 64
4341-2	1.55	2 to 16	3033-150E	10.0	16 to 64
14381-21	1.9	8 to 16	3033-200	27.7	64 to 128
4381-1	2.1	4 to 16	3033-200	27.7	32 to 128
#3373-80	2.5	8 to 16	3033-200E	31.9	64 to 128
4381-2	2.7	4 to 32	3033-200E	31.9	64 to 128
4381-12	2.7	8 to 32	3033-400	50.0	128 to 256
14381-22	3.2	16 to 32	3033-400E	56.0	128 to 256
4381-13	3.6	8 to 32	3033-600E	76.0	128 to 256
3033EX	4.4	8 to 32			
4381-3	4.5	8 to 32			
14381-23	4.5	16 to 64			

\* First Installation 1987  
First Installation 1st Oct 1988

The above information is intended as a guideline for computer users on relative computer systems instruction cycle times. All data have been derived from published documentation and represent reasonable estimates of average MIPS ratings. However, Randolph is

not responsible for the accuracy of the MIPS data. Cycle times will vary based on hardware software configurations and system manufacturers continually modify computer models as design improvements in hardware and software arise.

**TALK TO RANDOLPH NOW.** Whatever your computer system needs, Randolph can deliver the hardware when you need it... and ease the pressure on your DP budget with low lease rates. Call 800-243-5307, in CT (203) 661-4200.

# Randolph



Randolph Computer Corporation  
Subsidiary of Bank of Boston • 537 Steamboat Road, Greenwich, CT 06830



# ON-LINE WITH COMPUSOURCE

- Multiple centers
- MVS, VM, DOS, CICS, IMS
- RACF
- Decision support software including SAS
- Volume and term discounts
- Worldwide access
- Full technical support
- Laser printing
- Disaster recovery services

## COMPUSOURCE

(919) 469-3325

### FOR SALE

#### IBM SYSTEM 36

IBM 5362

60 meg Hard Disk

Call David at

(617) 537-9295

Evenings

(617) 459-4400

Days

### FOR SALE/LEASE

#### 4381-P11

Just off company

SAVE

## \$100,000!

Call Tom at

(213) 205-0222

4400 Wilshire Blvd

## HONEYWELL

LEVEL 6 DPS 6 SERIES 16

- Complete Minicomputer Line - New & Used
- All Peripherals and Terminals
- Upgrades and Features
- Direct Repair Capability
- Honeywell Maintenance Guarantee
- Immediate Delivery Low Prices

\* NEW PRODUCT \*

Full Line of

AT and XT Compatible PC's

The Recognized Leader in Honeywell

Minicomputer Sales and Support

100 Beaufort Rd. Northboro, MA 01552

tel: 303 58 20 7000 fax: 303 58 20 7000

100 Beaufort Rd. Northboro, MA 01552

tel: 303 58 20 7000 fax: 303 58 20 7000

100 Beaufort Rd. Northboro, MA 01552

tel: 303 58 20 7000 fax: 303 58 20 7000

100 Beaufort Rd. Northboro, MA 01552

tel: 303 58 20 7000 fax: 303 58 20 7000

100 Beaufort Rd. Northboro, MA 01552

tel: 303 58 20 7000 fax: 303 58 20 7000

100 Beaufort Rd. Northboro, MA 01552

tel: 303 58 20 7000 fax: 303 58 20 7000

100 Beaufort Rd. Northboro, MA 01552

tel: 303 58 20 7000 fax: 303 58 20 7000

100 Beaufort Rd. Northboro, MA 01552

tel: 303 58 20 7000 fax: 303 58 20 7000

100 Beaufort Rd. Northboro, MA 01552

tel: 303 58 20 7000 fax: 303 58 20 7000

100 Beaufort Rd. Northboro, MA 01552

tel: 303 58 20 7000 fax: 303 58 20 7000

100 Beaufort Rd. Northboro, MA 01552

tel: 303 58 20 7000 fax: 303 58 20 7000

100 Beaufort Rd. Northboro, MA 01552

tel: 303 58 20 7000 fax: 303 58 20 7000

100 Beaufort Rd. Northboro, MA 01552

tel: 303 58 20 7000 fax: 303 58 20 7000

100 Beaufort Rd. Northboro, MA 01552

tel: 303 58 20 7000 fax: 303 58 20 7000

100 Beaufort Rd. Northboro, MA 01552

tel: 303 58 20 7000 fax: 303 58 20 7000

100 Beaufort Rd. Northboro, MA 01552

tel: 303 58 20 7000 fax: 303 58 20 7000

100 Beaufort Rd. Northboro, MA 01552

tel: 303 58 20 7000 fax: 303 58 20 7000

100 Beaufort Rd. Northboro, MA 01552

tel: 303 58 20 7000 fax: 303 58 20 7000

100 Beaufort Rd. Northboro, MA 01552

tel: 303 58 20 7000 fax: 303 58 20 7000

100 Beaufort Rd. Northboro, MA 01552

tel: 303 58 20 7000 fax: 303 58 20 7000

100 Beaufort Rd. Northboro, MA 01552

tel: 303 58 20 7000 fax: 303 58 20 7000

100 Beaufort Rd. Northboro, MA 01552

tel: 303 58 20 7000 fax: 303 58 20 7000

100 Beaufort Rd. Northboro, MA 01552

tel: 303 58 20 7000 fax: 303 58 20 7000

100 Beaufort Rd. Northboro, MA 01552

tel: 303 58 20 7000 fax: 303 58 20 7000

100 Beaufort Rd. Northboro, MA 01552

tel: 303 58 20 7000 fax: 303 58 20 7000

100 Beaufort Rd. Northboro, MA 01552

tel: 303 58 20 7000 fax: 303 58 20 7000

100 Beaufort Rd. Northboro, MA 01552

tel: 303 58 20 7000 fax: 303 58 20 7000

100 Beaufort Rd. Northboro, MA 01552

tel: 303 58 20 7000 fax: 303 58 20 7000

100 Beaufort Rd. Northboro, MA 01552

tel: 303 58 20 7000 fax: 303 58 20 7000

100 Beaufort Rd. Northboro, MA 01552

tel: 303 58 20 7000 fax: 303 58 20 7000

100 Beaufort Rd. Northboro, MA 01552

tel: 303 58 20 7000 fax: 303 58 20 7000

100 Beaufort Rd. Northboro, MA 01552

tel: 303 58 20 7000 fax: 303 58 20 7000

100 Beaufort Rd. Northboro, MA 01552

tel: 303 58 20 7000 fax: 303 58 20 7000

100 Beaufort Rd. Northboro, MA 01552

tel: 303 58 20 7000 fax: 303 58 20 7000

100 Beaufort Rd. Northboro, MA 01552

tel: 303 58 20 7000 fax: 303 58 20 7000

100 Beaufort Rd. Northboro, MA 01552

tel: 303 58 20 7000 fax: 303 58 20 7000

100 Beaufort Rd. Northboro, MA 01552

tel: 303 58 20 7000 fax: 303 58 20 7000

100 Beaufort Rd. Northboro, MA 01552

tel: 303 58 20 7000 fax: 303 58 20 7000

100 Beaufort Rd. Northboro, MA 01552

tel: 303 58 20 7000 fax: 303 58 20 7000

100 Beaufort Rd. Northboro, MA 01552

# BIDS & PROPOSALS

### REQUEST FOR PROPOSAL

Expanding communications equipment on present IBM 5360 computer. Proposals must be sealed and received by December 1, 1987. For RFP information contact Pam Albrecht, Mead County, Data Coordinator, 830 11th St. East, Glencoe, MN 55336. Telephone: (612) 864-5551 Ext. 325.

Mead County retains the right to amend the RFP and reject any or all proposals.

An Equal Opportunity Employer

### NOTICE OF REQUEST FOR PROPOSAL

The Northeast Ohio Area-wide Coordinating Agency (NOACA), a governmental agency located in Cleveland, Ohio is soliciting proposals to supplement its data processing services. Copies of proposal documents may be obtained from NOACA, 1501 Euclid Avenue, Cleveland, Ohio 44115 or by calling (216) 241-2414 Monday through Friday 9:00 AM - 4:00 PM, commencing October 5, 1987. Ask for Warren or Janet.

A pre-proposal conference is scheduled to be held at NOACA at the above address at 2:00 PM, October 29, 1987.

Proposals are to be submitted to NOACA November 16, 1987 no later than 12:00 Noon.

An Equal Opportunity Employer

The Sacramento Municipal Utility District is considering replacement of its customer information/billing system. A software search is underway to identify qualifying package software. To qualify, software must be operating in a utility environment and run on an AMDahl 5990 series computer utilizing MVS.

In addition, the District will give preference to systems which utilize Cullinet's IDMS environment. Qualified vendors should respond by November 6, 1987 to Diane Demanett, Project Planning Manager, Sacramento Municipal Utility District, P.O. Box 15830, Sacramento, CA 95852-1830.

### IBM 4381-Q14

El Paso county will receive sealed bids for purchase of below equipment until 9:30 a.m. 11/16/87. Successful bidder announced 11/23/87. Equipment available to purchaser on 11/1/88; must remove before 1/31/88. Purchaser responsible for crating plus freight out. Min. bid: \$410,000. Bid bond for 5% of bid must accompany bid. Full purchase price must be deposited in trust for El Paso County ten days after bid award and paid to El Paso County on 1/1/88. 4381-Q14 dual processor; serial number 12064. (two instructions processing units Storage: 24 MB; two 64 KB high speed buffers CHANNELS: 12 two byte and 10 block multiplexers) Console: 3278-2A 4632 keyboard OTHER: 208 VOLT, 3 PHASE, 3 wire, 50 HZ. RFP certified for IBM maintenance ADDRESS SEALED BIDS TO:

Pit Vasquez  
County Purchasing Agent  
City-County Building  
Bid #87-127  
El Paso, TX 79901

### NYS Higher Education Services Corp. Request For Proposal

The Corporation will issue a Request For Proposal for a new computer hardware and software environment. Vendors will have the discretion to propose: a hardware environment including all operating system software, utilities and services; and/or a database management system including development, software, data communications software, additional software and services. The new environment will replace our IBM and Honeywell mainframe computer systems currently located at a single site in Albany, New York. Copies of the RFP will be available beginning October 26, 1987. Proposals must be submitted to the corporation by December 30, 1987. C.O.B. Direct inquiries to Mr. John J. Wheeler, Administrative Officer, NYSHESC, 99 Washington Ave., Albany, NY 12255. (518) 473-1200.

### SOFTWARE SALES RESULTS!

Increase sales of your IBM mainframe or PC software product without investing in a regional office.

WE SELL quality

- systems software to MIS professionals
- PC software to vertical markets

We have the right mix of sales and technical expertise to deliver results!

For information contact:

Main Frame Software Corporation  
2500 East Rialto Drive  
Scottsdale, AZ 85260  
(602) 483-9665

### FOR SALE

LCM-500 Enhanced Switching Systems  
I/O CHANNELS-PERIPHERAL  
CONTROL UNIT MATRIX SWITCHES

AVAILABLE UNITS:

4x6 \$16,000.  
8x6 \$26,000.  
8x6 & 6x2 \$36,000.

Nation Wide Maintenance Available

1-800-MEGAMEM

In Calif. 408-435-1414

LOCOMP

Member CDLA

### STRATUS

For Sale  
Never Been Used

\*XA440 8Mb Duplex  
W/448Mb Disks  
Substantial Discount

Call P.R.I. for more info  
415 449-2120  
Chris Duncan

### BASIC FOUR FOR SALE (3)-730 SYSTEMS

192k/160k/160k  
Each has: Lightning  
(2) 75 meg disks  
(2) 8-way controllers  
Parallel port-Sync. comm.

Contact: Ron Dillon  
(312) 598-3603

### CLASSIFIED ADVERTISING ORDER FORM

Issue Date: Ad closing is every Friday, 10 days prior to issue date.

Sections: Please be sure to specify the section you want: Time, Services & Software, Computer Careers and Buy/Sell/Swap. (Available upon request: Software Wanted, Real Estate, and others).

Copy: We'll typeset your ad at no extra charge. Please attach CLEAN typewritten copy. Figure about 25 words to a column inch, and costs \$352.60 per insertion. Extra space is available/and billed in half-inch increments and costs \$88.20. Box numbers are \$15.00 extra per insertion.

Cost: Our rates are \$176.40 per column inch. (Each column is 1 13/16" Minimum size is two column inches (1 13/16" wide by 2" deep) and costs \$352.60 per insertion. Extra space is available/and billed in half-inch increments and costs \$88.20. Box numbers are \$15.00 extra per insertion.

Billing: If you're a first-time advertiser, (or if you have not established an account with us,) WE MUST HAVE YOUR PAYMENT IN ADVANCE, or a Purchase Order Number. Any extensions on this policy must be made through our Credit Department.

Ad size desired:

\_\_\_\_\_ columns wide by \_\_\_\_\_ inches deep.

Issue Date(s): \_\_\_\_\_

Section: \_\_\_\_\_

Name: \_\_\_\_\_

Company: \_\_\_\_\_

Title: \_\_\_\_\_

## 129



# DECEMBER'S COMPUTERWORLD FOCUS ON SOFTWARE CAN KEEP YOUR SALES UP AND RUNNING.

## COMPUTERWORLD FOCUS ON SOFTWARE CLOSES OCTOBER 30!

Software. It's the key component to every computer system. Even the most sophisticated hardware is virtually worthless without compatible software that can run on it. And the success of every information system depends on having the right software for the right job.

That's why MIS/DP and other information systems professionals won't miss the December 2 *Computerworld Focus* on Software. They'll turn to it for comprehensive coverage of the software industry's most recent products and trends, as well as future developments. And that means you can capture the attention of over 125,000 paid *Computerworld* subscribers — plus thousands of pass-along readers — with your related advertising message.

### In December we focus on software and distribute bonus copies at DEXPO West.

#### **Special section: Mainframe software**

An in-depth discussion of the newest products and most recent trends in mainframe software — and how mainframe software is being used on micros and other systems.

#### **SQL, DB2, and CASE**

A critical analysis of these specialized products — what they offer users, how to choose and implement these technologies, and what developments can be expected.

#### **Artificial intelligence products**

A look at the state of artificial intelligence products with an eye toward future developments and practical applications. Plus a highlight of expert systems.

#### **High level C language**

A discussion of high level C programming language — what products are utilizing it and how it is impacting MIS/DP planning and purchasing patterns.

#### **Executive information systems**

An examination of executive information systems that incorporate easy-to-use interfaces and strategic decision-making capabilities for top-level professionals.

#### **Project management software**

An update of which project management software products are available, how they're being used, and what functions and applications users really need.

Your ad in the December 2 *Computerworld Focus* on Software can keep your customers' hardware — and your sales — up and running. But hurry — you must reserve your advertising space by October 30.

For more information, contact Ed Marecki, Vice President/Sales, *Computerworld Focus*, 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171, (617) 879-0700. Or call your local *Computerworld* sales representative.

# COMPUTERWORLD

# F O C U S

SALES OFFICES: BOSTON: (617) 879-0700/NEW YORK: (201) 967-1350/WASHINGTON, D.C.: (703) 280-2027/ATLANTA: (404) 394-0758/  
CHICAGO: (312) 827-4433/DALLAS: (214) 233-0882/SAN FRANCISCO: (415) 347-0555/LOS ANGELES: (714) 261-1230



# COMPUTERWORLD

## SALES OFFICES

Publisher/James S. Povec

Vice President/Sales/Edward P. Marocki, COMPUTERWORLD, 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171, (617) 879-0700

BOSTON: Northern Regional Manager/Michael F. Kelleher, District Managers/David Peterson, Bill Caddigan, Sherry Driscoll, Account Manager/John Watts, Sales Assistant/Robert A. Raudys, COMPUTERWORLD, 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171 (617) 879-0700

CHICAGO: Midwest Regional Manager/Russ Gerches, District Managers/Kevin McPherson, Larry Craven, Account Manager/Robert A. Raudys, Sales Assistant/Kathy Sullivan, COMPUTERWORLD, 10400 West Higgins Road, Suite 300, Rosemont, IL 60018, (312) 827-4433

NEW YORK: Eastern Regional Director/Michael J. Masters, Senior District Manager/Doug Cheney, District Managers/Fred Lo Sapio, Frank Genovese, Account Managers/Paula Smith, Helene Tepperman, Sales Assistants/Walter Tagliapietra, Sue Larson, Ellen Lobough, COMPUTERWORLD, Paramus Plaza I, 140 Route 17 North, Paramus, NJ 07652 (201) 967-1350

LOS ANGELES: Western Regional Director/Mark V. Glasner, District Managers/Carolyn Knox, Gary Hooks, COMPUTERWORLD, 18004 Sky Park Circle, Suite 255, Irvine, CA 92714 (714) 261-1230

SAN FRANCISCO: Western Regional Director/Mark V. Glasner, Senior District Manager/Ernie Chamberlain, District Managers/Jan Harper, Steven Phillips, Account Manager/Alicia Holm, COMPUTERWORLD, 500 Airport Boulevard, Suite 400, Burlingame, CA 94010 (415) 347-0555

ATLANTA: Eastern Regional Director/Michael J. Masters, District Manager/Jeffrey Meindick, Sales Assistant/Melissa Christie, COMPUTERWORLD, 1400 Lake Hearn Drive, Suite 330, Atlanta, GA 30319 (404) 394-0758

DALLAS: Midwest Regional Manager/Russ Gerches, District Manager/Kevin C. Harold, COMPUTERWORLD, 14651 Dallas Parkway, Suite 304, Dallas, TX 75240 (214) 233-0882

## CW PUBLISHING/INC.

An IDG Communications Company

James S. Povec/Publisher

Computerworld Headquarters: 375 Cochituate Road, P.O. Box 9171, Framingham, MA 01701-9171

Phone: 617-879-0700, Telex: 95-1183, FAX: 617-875-8931

SALES: Vice President/Display Sales, Edward P. Marocki, National Recruitment Sales Director, John Corigan, District Sales Operations Manager, Carolyn Knox, District Advertising Sales Director, Margaret Carter, Classified Operations Manager, Cynthia Delany

MARKETING: Director of Marketing, Bob Singer, Marketing Services Manager, Audrey Shohan

PRODUCTION: Production Director, Peter Holm, Senior Production Manager, Leigh Swearingen, Typesetting Manager, Carol Pollock, Art Director, Tom Monahan

CIRCULATION: Circulation Director, Nancy L. Merritt

## FOREIGN EDITORIAL/SALES OFFICES

Argentina: Ruben Argento, CW Communications S/A, Av. Belgrano 406-Piso 9, C1092 Buenos Aires, Phone: (011) 54 134-5583, Telex: (390) 2264 (BAZAN AR)

Australia: Alan Power, Computerworld Pty. Ltd., 37-43 Alexander Street, Crows Nest, NSW 2065, Phone: (011) 61 2 4395133, Telex: (790) AA74752 (COMWOR)

Austria: Manfred Weiss, CW Informations Verlagsgesellschaft m.b.H., Josefstadt Strasse 74, A-1080 Wien, Austria, Phone: (011) 43 22486 5910, Telex: (847) 115 542 (SCH/A)

Brazil: Ney Nuvell, Computerworld do Brasil, Rua Alcindo Guaranira, 25-11 and 20-031, Rio de Janeiro, Brazil, Phone: (011) 55 21 240 8225, Telex: (391) 21 30838

Denmark: Preben Engel, Computerworld Danmark A/S, Torngade 52, 1400 Copenhagen K, Denmark, Phone: (011) 45 1955 695, Telex: (2624) 31566

France: Jean-Louis Rendou, Computerworld Communications S.A., 185 Avenue Charles de Gaulle, 92200 Neuilly Sur Seine, France, Phone: (011) 33 14 747 1272, Telex: (842) 613234 F

Hungary: Dossa Futaz, Computerworld Informatics Co., Ltd., H-1336 Budapest, P. 386, Hungary, Phone: (011) 36 1 228 458, Telex: (861) 22 6307 (KSHP H)

Italy: Dr. Bruno Fazzini, Computer Publishing Group S.R.L., Via Viala 7, 20127 Milano, Italy, Phone: (011) 39 02 2613432, Telex: (843) 33518

Japan: Mr. Shuji Mizuguchi, Computerworld Japan, 7-4 Shintomi 1-Chome, Chuo-ku, Tokyo 104, Phone: (011) 81 3 551 3882, Telex: (781) 252-4217 (Computerworld Japan on)

M. Nakamura, IDG Communications, Japan, c/o Marcom International, Inc., Asakusa Center Building, 1-3-12 Motoakusaka, Minato-ku, Tokyo 107, Japan, Phone: (011) 81 3 403-8515, Telex: (781) 27941 (rep for all CW Publishing publications except Computerworld Japan)

Mexico: Henry Morales, Computer Mexico S.A. de C.V., Oaxaca 21-2, Mexico City 7 D.F., Colonia Roma, 06700 Mexico, Phone: (055) 514-4218 or 6309, Telex: (383) 177 1300 (ACHAME)

## IDG COMMUNICATIONS/INC.

Patrick J. McGovern

Board Chairman

Axel Leblond

Chief Executive Officer

William P. Murphy

Vice President/Finance

Computerworld is a publication of IDG Communications, the world's largest publisher of computer-related information. IDG Communications publishes over 90 computer publications in 33 countries. Fourteen million people read one or more IDG Communications publications each month. IDG Communications publications contribute to the IDG News Service, offering the latest on domestic and international computer news. IDG Communications publications include: ARGENTINA's Computerworld Argentina; ASIA's Communications World, Computerworld Hong Kong, Computerworld Malaysia, Computerworld Singapore, Computerworld Southeast Asia, PC Review; AUSTRALIA's Computerworld Australia, Communications World, Australian PC World, Australian Macworld; AUSTRIA's Computerworld Österreich; BRAZIL's DataNews, PC Mundo, Micro Mundo; CANADA's Computer Data; CHILE's Informatica, Computer Personal; DENMARK's Computerworld Denmark, PC World Denmark; FINLAND's Mikro, Tietovirkko; FRANCE's Le Monde Informatique, Distributec, Infapic, Telecom International; GREECE's Mikro and Computer Age; HUNGARY's Computerworld SZT; ILLINOIS' IDG's Dataquest; ISRAEL's People & Computers Weekly, People & Computers Weekly; ITALY's Computerworld Italia; JAPAN's Computerworld Japan; MEXICO's Computerworld Mexico; THE NETHERLANDS' Computerworld Netherlands, PC World Benelux; NEW ZEALAND's Computerworld New Zealand; NORWAY's Computerworld Norge, PC World Norge; PEOPLE'S REPUBLIC OF CHINA's China Computerworld, China Computerworld Monthly; SAUDI ARABIA's Computerworld Saudi Arabia; SOUTH KOREA's Computerworld Korea, PC World Korea; SPAIN's CMWORLD, Computerworld España, Commodore World, PC World España, Comunicaciones World, Informatica Industrial; SWEDEN's ComputerSweden, MikroData, Svenska PC World; SWITZERLAND's Computerworld Schweiz; UNITED KINGDOM's Computer News, DEC Today, PC World, LOTUS, PC Business World; UNITED STATES' Amiga World, CD-ROM Review, CIO, Computer Currents, Computerworld, Computers in Science, Digital News, Federal Computer Week, 80 Micro, FOCUS Publications, Inc., InControl, Macintosh Today, Macworld, Computer + Software News (Micro Macintosh), Network World, PC World, Portable Computer Review, Publisher, PC Resources, Run, Windows; VENEZUELA's Computerworld Venezuela; WEST GERMANY's Computerwoche, Information Management, PC Week, PCWoche, Run

# ADVERTISERS INDEX

ADP .....	70	Innovation Data Processing .....	7
ADR .....	44-45	Interface Group .....	107-111
Alcatel Business Systems .....	64-65	Interface Systems .....	67
Alloy Computers .....	80	Itro Systems .....	70
Altai .....	524	Knowledgeware .....	43
Altai .....	43,58-59,96-97,54-55	Kolinar .....	43
Bell Atlantic .....	82-83	Landmark Systems .....	SC2
Bluewin Software .....	514	Lawson .....	71
BMC Software .....	515	Lotus .....	34
Business Software .....	18	McCormack & Dodge .....	41
Cambex .....	95	MCI International .....	84
Candle Corp. ....	56-57,512-513	Memorex .....	26-27
Catalyst .....	74	Micro Focus .....	37
CGI Sys'tems .....	98-99	Microcom .....	81
Chicago Soft .....	16	Mid-American Control Corp. ....	50
Cincom Systems .....	62	Morino Associates .....	5C3
Codes .....	78-79,104	Motorola .....	60/61
Communication Networks .....	103	MSA .....	94
Compuware .....	54	NEC .....	48-49
Control Data .....	114-115	Nec .....	16
Corporate Class Software .....	112	On-Line Software .....	29,31,33,35,50-51,85
Cullinet Software .....	68-69	Oracle .....	11
CW Focus .....	130	Proquiti .....	73
CW House .....	113	Realia .....	63
Data General .....	42	Relational Technology .....	24
Datashout .....	40	Robert Half & Associates .....	72
Dow Jones Service .....	99	SAS Institute .....	12-13,53
Dresselhaus Computer Products .....	14	Sequala .....	36
Duquesne Systems .....	38	Softouch Systems .....	60
Dynasoft .....	107	Software AG .....	32
Empact Software .....	56	Software Engineering of America .....	9
Encore International .....	66	Software Technology & Research (STAR) .....	109
Fischer International .....	25	SQ Software .....	29
Forthright Systems, Inc. ....	58	Synco .....	5
Goal Systems .....	90	Synco Systems & Telecom .....	22
Hayes Microcomputing .....	30	Systems Center .....	15,17
Help/38 Systems .....	51	Tandem Computers .....	106
Highland Express .....	14	Tandon .....	93
H&M Systems .....	135	Technology Transfer Institute .....	60
Homan Management .....	98	3Com .....	100-101
Honeywell Bull .....	54-55	Texas Instruments .....	510-511
Hughes Aircraft Company .....	92	Trax Software .....	110
IBM .....	23	Unilase Systems Inc. ....	28
i&X Software .....	90	Unisys .....	86
Imperial Technology .....	10	VAX Business Forum .....	108
Information Builders .....	52	Ver-tel .....	136
Information Dimensions .....	76-77	Vortex .....	72-73
Informix .....	46-47	VM Software .....	19
		Wyse Technology .....	52/53
		Xerox .....	91

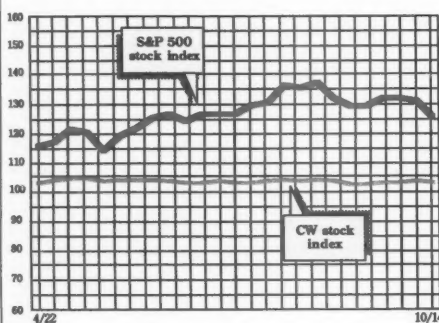
This index is provided as an additional service. The publisher does not assume any liability for errors or omissions.



## Upcoming Computerworld Spotlight Sections

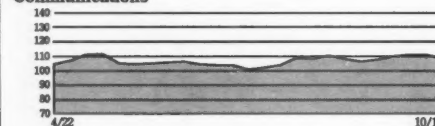
Issue Date	Topic	Ad Closing Date
Nov. 9	Application Development Tools	Oct. 23
Nov. 16	Communications	Oct. 30
Nov. 23	Artificial Intelligence	Nov. 6
Nov. 30	Power Protection Equipment	Nov. 13
Dec. 7	DEC-Compatible Hardware	Nov. 20
Dec. 14	Add-In Boards	Nov. 25
Dec. 21	Spreadsheets Software	Dec. 4

# STOCK TRADING INDEX

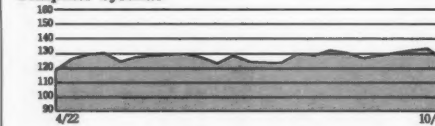


Indexes	Last Week	This Week
Communications	110.8	108.3
Computer Systems	133.2	125.5
Software & DP Services	143.3	137.5
Semiconductors	99.2	92.8
Peripherals & Subsystems	112.8	107.9
Leasing Companies	114.7	121.2
Composite Index	103.4	102.9
S&P 500 Index	130.6	125.1

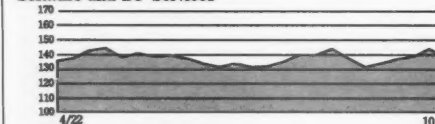
## Communications



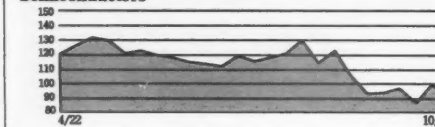
## Computer Systems



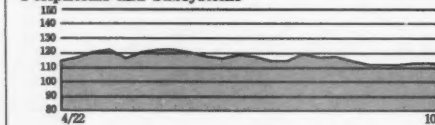
## Software and DP Services



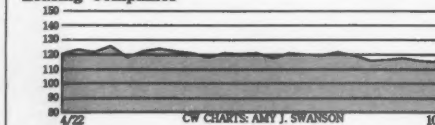
## Semiconductors



## Peripherals and Subsystems



## Leasing Companies



CW CHARTS: AMY J. SWANSON

# Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, OCTOBER 14, 1987

		52-WEEK RANGE	PRICE OCT. 14 1987	WEEK NET CHG	WEEK PCT CHG																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
--	--	---------------	--------------------	--------------	--------------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

## Esber: Dbase language not for public domain

BY ALAN J. RYAN  
CW STAFF

CAMBRIDGE, Mass. — Ashton-Tate Chairman Ed Esber threw down the gauntlet last week, declaring that Dbase is proprietary technology that Ashton-Tate will protect through legal channels if necessary.

Software developers and Dbase experts contacted by *Computerworld* said they were surprised by Esber's comments, delivered at the Software Publishers Association conference here. They countered that Ashton-Tate's position flies in the face of widespread opinion that a language is not copyrightable.

"The Dbase standard belongs to Ashton-Tate, and Ashton-Tate intends to vigorously protect it," Esber said. "It's proprietary technology."

Ashton-Tate's corporate counsel, Geoff Berkin, said the language is part of a copyrighted product. "We don't have a product called Dbase language," he said. "We have Dbase III Plus, which contains a lot of elements. The Dbase language is one component of a copyrighted product."

**'Look and feel' precedent**  
Berkin said other recent industry lawsuits, including Lotus Development Corp.'s "look and feel" suits against 1-2-3 clone makers, have "affected how one thinks about things like this. At this time, we have no specific plans to take legal action against any other companies," he added.

"As Lotus and other software company suits clarify the law and drive legal precedents, our position will be stronger," Esber said during the speech.

Esber's remarks were directly targeted at the Dbase Standards Committee, which had assembled to hold a panel discussion on building a standard around Dbase. "Just by collecting a group of Dbase competitors, you cannot and will not put Dbase into the public domain," Esber told them.

"We've communicated to the Standards Committee our concern about the use of the word Dbase. We don't want it to appear that this is a sanctioned activity or that they have any right to put out a product they're going to call Dbase," Berkin said.

"The basic issue is that Dbase III Plus is an Ashton-Tate product, and we own the product. It would put the product on more computers if we gave it away for free, but that's not in Ashton-Tate's best interest," Berkin said. "I don't think the Standards Committee is trying to sell more

copies of Ashton-Tate products."

But Standards Committee members said the purpose of setting standards is to benefit users.

David Fulton, president of Standards Committee member Fox Software, Inc. in Perrysburg, Ohio, said, "As a company, the committee doesn't do us any good at all, but creating standards is in the public interest." Fox markets a Dbase language interactive compiler.

George Juarez, chairman and chief executive officer of Nantucket Corp. in Los Angeles, agreed. "It was never our opinion that Nantucket would benefit in any way from the committee," he said.

### 'Borders on antitrust'

Esber also complained that a gathering of companies that compete against Ashton-Tate "borders on antitrust." One of the principles of antitrust, according to Berkin, "is that competitors are not supposed to sit around and talk about how they'll compete with some other party. There are members of [the Standards Committee] that are competitors of each other and of Ashton-Tate."

But committee members scoffed at the antitrust allusion.

Nantucket's Juarez, a California-licensed attorney who stopped practicing law in February to run Nantucket, said, "I'm not aware of any law in the U.S. which makes it unlawful, from an antitrust standpoint, for any group of people to get together and agree that a certain set of standards would be optimal."

### Apples and oranges?

"We're not a competitor against Dbase," Fox's Fulton said. "I don't know of a single instance of somebody buying our product who didn't have Dbase. We are serving an after-market, just like people who sell parts for automobiles. We sell additional functionality."

Martin Rinehart, chairman of New York-based Wallsoft Systems, Inc. and also chairman of the Standards Committee, said, "One interpretation I've heard [of Esber's remarks] is that they're losing market share to the compatibles, and by threatening the legality, he hopes to dampen compatible sales."

"This is a short-sighted concern for Ashton-Tate," Rinehart continued. "Promoting their language as a standard for data processing on microcomputers — and soon on minicomputers — has got to be in their best interest. Turning it into a proprietary tool will certainly encourage the use of other languages."

## Bells hunger for service pie

BY PATRICIA KEEFE  
CW STAFF

SAN FRANCISCO — Pacific Telesis Group (Pactel) last week filed a proposal in U.S. District Court in Washington, D.C., that, if approved, would enable the regional Bell holding companies to offer consumers access to audio-text and videotex services and a variety of information data bases.

The filing came in response to a Sept. 10 ruling by U.S. District Judge Harold H. Greene that lifts certain restrictions on information services that were imposed on the holding companies under the 1984 consent decree.

However, Pactel spokeswoman Ginny Juhnke said that in his ruling, Greene "very loosely" defined information services and the areas that he would consider as "transmission-related" vs.

"content-related" services.

The holding companies and other groups had until Oct. 15 to file their proposed definitions of information services with Greene.

Besides Pactel, about 25 other groups filed proposals, including U.S. West, Ameritech, Bell South Corp., Southwestern Bell Corp., Nynex Corp., ADAPSO, MCI Communications Corp., U.S. Sprint Communications Co., Dun & Bradstreet Corp., GE Information Services, the Information Industry Association, Compuserve, Inc., the Videotex Industry Association and Tymnet, McDonnell Douglas Network Systems Co.

### The Pactel dictionary

Pactel defined transmission-type services to include "transforming, processing, guiding, storing or retrieving information in con-

nection with the transmission of information, provided such activities do not substantially alter the content of the information as sent and received." This could include electronic data interchange and electronic mail services.

The company is also proposing services that would provide introductory information content services and billing and collection services for information service providers. Electronic delivery of "white pages" that might include a listing of general product and business categories, service or product providers and their telephone numbers and addresses is another Pactel proposal.

Pactel's definition allows for changes in the form of transmitted messages but does not allow for substantial changes to the content of messages.

## It's Basic

FROM PAGE 1

of applications. Basic could also serve as an applications development language for data bases.

Microsoft may be met with resistance by users familiar with its MS-DOS batch language and by Ashton-Tate Dbase programmers, many of whom earn their livelihoods developing Dbase applications.

### Waging war

The biggest battle may be to win over 1-2-3 users who have been trained in Lotus's macro language. Lotus is battling to move its users to Lotus Extended Applications Facility (LEAF), a new Lotus macro language for future versions of 1-2-3.

In addition to positioning Basic against LEAF, Microsoft's strategy is also aimed at blunting the inroads Borland International

has made into Microsoft language territory.

"One aspect of this is that [the strategy] is Microsoft's answer to LEAF but an answer to Borland as well," said Rob Dickerson, Microsoft product market manager for the languages group.

### Have a macro

One Lotus official took exception to Microsoft's Basic strategy. "Most of our customers, if given the choice, would like a variant of the C language," said Lotus spokesman Greg Jarboe, who explained that LEAF is similar to C. "If macros are so unnecessary, why put a macro translator in Excel?"

Microsoft may also position Basic as a data base development. "Most applications these days have a programming language. There is no reason to go off and invent hundreds of new crazy programming languages,"

Ballmer said.

"You can envision perhaps a data base product that used Basic as its language as opposed to the Dbase language or the PAL language [used in Paradox]. Why not use Basic? It is still by far the most popular programming language on PCs," he added.

Dickerson admitted that there are some shortcomings with the Basic macro strategy.

"Embedded macro languages are like the interface itself. If you can use the application, you can use the macros. Basic is a little more distant," he said.

The advantage, however, is that if users are developing macros to tie together disparate applications, they have to know each macro language, Dickerson added.

Despite some people's reservations, Microsoft is clearly committed to Basic. "Basic will never die. Basic races to the forefront again," Ballmer said.

## Microsoft takes another stab at Basic

Quickbasic 4.0, the \$99 product from Microsoft Corp. that combines a compiler, an interpreter and a debugger, may be the company's first step toward a brighter future for the industry's first microcomputer programming language.

The product, which can incorporate program changes at a rate of 150,000 line/min, adds record support, multiple modules in memory and enhanced debugging capabilities.

According to Rob Relf, a Seattle-based Quickbasic beta tester, the product includes improved on-line Help and better performance. "The program is pretty much recompiled as you edit it," he said.

Much of this performance comes from Microsoft's threaded P-code technology. With

threaded P-code, a program is compiled in a form that is "90% along the way to real native machine code," according to Microsoft.

The threaded P-code, however, retains enough information to allow it to be listed on-screen in source code form. As a result, the program can be easily modified without recompiling.

Quickbasic includes Codeview, a Microsoft debugger, support for mixed languages, instant syntax checking and instant command testing.

"It adds essentially all the things that people associate with modern languages, such as separate modules, and adds, for the first time, record structures, which are key for doing business applications," said Steve Ballmer, vice-president of systems software at Microsoft.

DOUGLAS BARNEY



## Pick slides system into PS/2 game plan

Version to work as primary operating system or guest system under OS/2

BY ED SCANNELL  
CW STAFF

IRVINE, Calif. — Pick Systems is slated to announce at Comdex/Fall '87 next month a version of its Pick operating system that works with IBM's Personal System/2 series.

The Pick system will reportedly operate as a guest system under OS/2, which is being jointly developed by IBM and Microsoft Corp.

It can also function as the PS/2's primary operating system, according to company officials.

"I think the advantage for us on the PS/2 is that users can start to get some real large computer capabilities on those low-

end boxes," said Dick Pick, the company's founder and president and developer of the Pick operating system.

The new Pick system has a distinct advantage over OS/2 in corporate accounts, Pick claimed, because OS/2 is primarily aimed at making single users more productive rather than at increasing a department's or company's productivity. On the other hand, the Pick operating system encourages interdepartmental productivity.

### Automating organization

"OS/2, which is the state of the art on the PC side, is still directed at automating the individual," Pick said.

"Our approach is toward

automating the whole organization, and for that, you need a multiuser data management system. And that is not what OS/2 can do," he added.

Pick said he plans to license the new system. He said he has been approached by several top microcomputer suppliers who are interested in selling Pick with their products. Pick would not specify which companies had approached him.

A three-user version of the Pick system for the PS/2 Model 60 costs \$795; a 10-user version costs \$1,295.

The Pick system that supports three users on the PS/2 Model 80 costs \$895; a 10-user version costs \$1,495, according to the company.

"The NSA has expressed concern that the amount of information being protected by DES could motivate a hostile intelligence organization to mount a large-scale [code-breaking] effort against DES," said a statement filed by Gerald R. Young, the NSA's deputy director for plans and policy.

Therefore, Young called for a compromise that would limit DES to financial transactions and support NSA's algorithms for other applications [CW, March

AT&T, NCR Corp., Digital Equipment Corp., Paradyne Corp. and Honeywell Bull, Inc.

"Because government agencies are big customers of DES products, the DES market may disappear if government agencies are forced to stop buying DES products," AT&T said in its filing.

### Finally affordable

DES-based products have just recently come down to the price level at which corporate managers are willing to invest in encryption for information security, commentators said.

They warned against any government action that would discourage this trend.

One advantage of the federal endorsement is that the NBS runs a program for validating products that meet the standard.

"This is an invaluable service to commercial corporations that possess little expertise in cryptography," said a statement from Bank of America National Trust & Savings Association in San Francisco.

Several parties called for a two-track approach of providing support for DES until the alternative algorithms are readily available in low-cost products for all types of customer use.

## Encryption

FROM PAGE 1

in 1977 and is in the public domain.

In March, the NBS opened a regulatory proceeding to review the status of DES as a standard for unclassified federal information systems and sought public comments on whether to reaffirm, withdraw or limit the standard.

Because of the overwhelming

**T**HE DES market may disappear if government agencies are forced to stop buying DES products."

AT&T

support for DES shown in the public comments and the fact that there is no evidence that the DES algorithm has been compromised, NBS recently recommended that it be retained as a federal standard for another five years, according to NBS sources.

Final approval by the bureau's parent agency, the U.S. Department of Commerce, is expected in a month or two.

23]. But the intelligence agency was the only commenter that backed away from DES.

### Supporters

Support for DES was registered by the financial community, including the American Bankers Association, the Federal Reserve System and the U.S. Department of the Treasury; numerous federal agencies; and equipment vendors such as IBM,

Second-class postage paid at Framingham, Mass., and additional mailing offices.

Computerworld (ISSN 0010-4841) is published weekly, except: January (5 issues), February (5 issues), March (6 issues), April (5 issues), May (5 issues), June (6 issues), July (5 issues), August (6 issues), September (6 issues), October (5 issues), November (7 issues), December (4 issues) and a single combined issue for the last week in December and the first week in January by CW Publishing/Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171. Copyright 1987 by CW Publishing/Inc. All rights reserved.

Computerworld can be purchased on 35 mm microfilm through University Microfilm Int. Periodical Entry Dept., 300 Zeeb Road, Ann Arbor, Mich. 48106. Computerworld is indexed: write to Circulation Dept. for subscription information. Photocopy rights: permission to photocopy for internal or personal use or the internal or personal use of specific clients is granted by CW Publishing/Inc. for libraries and other users registered with the Copyright Clearance Center (CCC), provided that the base fee of \$3.00 per copy of the article, plus \$.50 per page is paid directly to Copyright Clearance Center, 21 Congress Street, Salem, Mass. 01970.

Permission to photocopy does not extend to contributed articles followed by this symbol. ‡ Special requests for reprints and permission should be addressed to Nancy M. Shannon, CW Publishing/Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171. Subscriptions call toll free (800) 255-6286 or in New Jersey call (800) 322-6286. Subscription rates: \$2.00 a copy; U.S. — \$44 a year; Canada, Central & So. America — \$110 a year; Europe — \$165 a year; all other countries — \$245 a year (airmail service). Four weeks notice is required for change of address. Allow six weeks for new subscription service to begin.



POSTMASTER: Send Form 3579 (Change of Address) to Computerworld, Circulation Department, P.O. Box 1566, Neptune, NJ 07754-1566.

## INSIDE LINES

**De-wooing Dae Woo?** Leading Edge is about to drop its Taiwan-based manufacturer Dae Woo and either select another Taiwanese firm or start manufacturing its own systems, dealers said last week. Word has it that Acer Technologies has the inside track in the competition. Acer has scheduled a press conference at next month's Comdex/Fall '87 to announce a "major agreement with an American compatible maker," according to the firm's public relations people, although they declined to provide details. Acer is one of the top three or four computer manufacturers in Taiwan.

**Secret courtship.** Wang and ITT explored merger possibilities in 1985, according to a forthcoming book by ITT Chairman Rand V. Araskog. Wang confirmed last week that Araskog met with Wang Chairman An Wang at that time, when ITT was fending off hostile takeover attempts. Araskog's book, *Tumultuous Years: A Personal Account of the Rebuilding of ITT*, will also relate a potential ITT-Burroughs merger discussion between Araskog and now Unisys Chairman W. Michael Blumenthal.

**In transit.** IBM's 9370 Models 40 and 90 began shipping Oct. 2 without the fanfare that has lately become customary for the company. IBM had promised the two models would hit the streets in October.

**Packing the tool kit.** Apollo is scheduled tomorrow to introduce the first product based on its Network Computing System (NCS), a concept that will allow pieces of applications to be simultaneously processed on different resources in a heterogeneous network. The NCS product is reportedly a tool to help manage applications that are spread across a network. Also, the vendor plans to announce that NCS will be available for additional operating environments. It already supports the Apollo platform and other Unix-based systems as well as DEC's VMS systems.

**Storm clouds up high.** War may be brewing between neighbors Quadram and Digital Communications Associates (DCA). Today, Quadram is expected to jointly announce with Chips and Technologies that it will build low-cost IBM 3270 emulation boards to compete directly with DCA's Irma boards. Meanwhile, DCA is hosting an elaborate press junket the same day in the town of Remote (get it?), Ore., population 15. The plot is to whisk reporters in Lear jets from San Francisco and San Jose, Calif., to Oregon, where DCA will unveil remote (get it now?) micro-to-mainframe communications products in the town's general store.

**Reality check.** Zenith Data Systems has boldly promised to ship OS/2 by the end of the year. But Steve Ballmer, vice-president of systems software for Microsoft, doesn't think they'll make it. "I don't think it will ship this year," Ballmer said. Microsoft is apparently on schedule to ship the next-generation microcomputer operating system to its hardware OEMs within a month, but it will take some time for the hardware vendors to add device drivers and take care of final hardware modifications.

**Watching the ticker.** As of press time Friday, Telex had not responded to the Oct. 8 tender offer of \$65 per share launched by arbitrageur Asher Edelman. Analysts have speculated that Edelman might increase the offer, but he would probably wait until after a Telex response before doing that. Telex stock, which rose sharply Oct. 9 to 70%, eased back to 67% at the close of trading Thursday.

**Rodney Dangerfield Enterprises.** In the midst of the dust storm being kicked up by IBM and DEC in their battle for the mid-range, some other companies just aren't getting any respect. When word came out that Wang planned a product introduction for today, a preannouncement poll of a dozen consultants and analysts who normally follow Wang typically brought this kind of response: "I've been so busy with IBM and DEC that I haven't talked to Wang in months." Those observers who did speculate listed PC connectivity tools, low-end systems in the DEC VS 5 and VS 6 class and the promised high-end VS 7320 as the products most likely to debut.



H&M'S FINEST



# SOFTMENU<sup>®</sup>

CICS · MENU · SECURITY

**It's not just its many fine features that make SoftMenu such a tempting dish...**

**Increase CICS Uptime**

SoftMenu eliminates constant modifications for your application and user definitions. Time-consuming CICS table maintenance and CICS restarts become a thing of the past. SoftMenu's dynamic system maintenance also makes all modifications available immediately.

**Save Programming**

SoftMenu reduces the need to create and maintain application calling sequences. Extended transaction calls pass functional data with the transaction ID and save you up to 30% of your programming. SoftMenu's dynamic switching of terminals between upper and mixed case eliminates many problems that previously occurred when upper/mixed case processing was required.

**Departmental Security and Task Management**

With SoftMenu, user authorization is assigned and removed by departmental management. This guarantees all changes are immediately active and reduces the demands on your DP department.

**All-Around Security**

SoftMenu fully meets the demands of auditors and management: central sign-on, automatic sign-off of unattended terminals, freely definable password duration and menu-guided application selection exclude all unauthorized system use.

**Immediate User Acceptance**

User acceptance of applications is increased since the usual blank screen and confusing transaction codes are replaced by the SoftMenu sign-on screen. Once signed-on, the user receives standardized menus containing the assigned applications. Messages are displayed in plain English and meaningful descriptions are used instead of hard-to-memorize transaction abbreviations.

**No Implementation Overheads**

SoftMenu runs without any user program modifications under VSE/SP, OS and MVS — including full MRO and ISC support. Convince yourself and mail now for a trial installation.

**H&M**  
**SOFTWARE'S FUTURE**

H&M Systems Software, Inc.  
25 E. Spring Valley Ave., Maywood, N.J. 07607-9982  
Phone: 1-(201)845-3357  
TOLL FREE: 1-(800) FOR DEMO

Menu 87-115

**MAIL FOR MORE INFORMATION**

Name

Company

Department

Phone

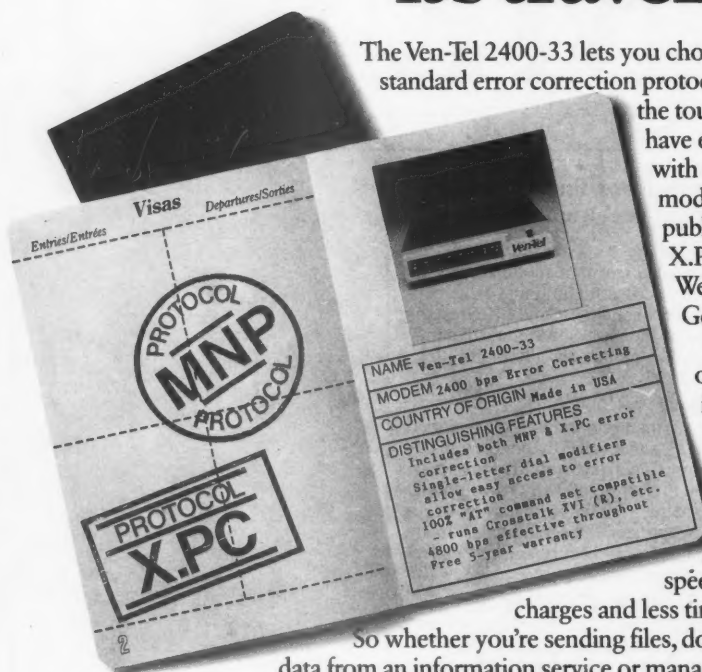
Street

City, State, Zip

CPU  Op. System

H&M Systems Software, Inc., 25 E. Spring Valley Ave.  
Maywood, N.J. 07607-9982, Phone: 1-(201)845-3357

# The error correcting modem that ensures safe passage for your data—no matter where it's traveling.



The Ven-Tel 2400-33 lets you choose between the two standard error correction protocols (X.P.C. and MNP) at the touch of a key. So you'll have error free connections with over 350,000 MNP modems *and* with major public data networks using X.P.C.—like Tymnet, MCI, Western Union and GE Geisco.

And the 2400-33 not only protects your data, it's faster than *any* non-error corrected modem. MNP Level 5 data compression can double your throughput up to 4800 bps—and higher speeds mean reduced phone

charges and less time spent transmitting.

So whether you're sending files, downloading expensive data from an information service or managing your personal portfolio, you'll know that your critical data is 100% correct.

The Ven-Tel 2400-33. The only modem that guarantees your data a flawless trip...no matter where it's traveling.

## Ven-Tel

Modems

Our free booklet, "How To Select The Correct Modem," contains specific information about the 2400-33 and our full line of modems. To request your copy, call 800-538-5121.

